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OF THE

ROYAL ANTHROPOLOGICAL INSTITUTE

OF

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VOL. XLVI.

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NOTICE.

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The Index to the present volume includes an index to the Institute's monthly publication MAN for the year of issue 1916.

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JOURNAL
OF THE
ROYAL ANTHROPOLOGICAL INSTITUTE
OF GREAT BRITAIN AND IRELAND.

MINUTES OF THE ANNUAL GENERAL MEETING,

JANUARY 18TH, 1916.

Professor A. KEITH, *President, in the Chair.*

The Minutes of the last Annual General Meeting were read and confirmed.

The PRESIDENT appointed Mr. S. H. RAY and Dr. R. J. GLADSTONE as scrutineers, and declared the ballot open.

The ACTING SECRETARY read the Report of Council for 1915, which was accepted.

The TREASURER read his Report for 1915, which was also accepted.

The PRESIDENT then delivered his address, entitled "On Certain Factors concerned in the Evolution of Human Races."

The SCRUTINEERS handed in their report, and the following were declared to be duly elected as Officers and Council for 1916-17 :—

President.—A. Keith, M.D., LL.D.

Vice-Presidents.

T. A. Joyce, M.A.

C. G. Seligman, M.D.

Sir Everard im Thurn, [¶]K.C.M.G., C.B.

Joint Hon. Secretaries.

H. S. Harrison, D.Sc.

T. A. Joyce, M.A.

Hon. Treasurer.—R. W. Williamson, M.Sc.

Council.

C. O. Blagden, M.A.

H. J. Brauholtz, B.A.

Miller Christy.

O. M. Dalton, M.A., F.S.A.

M. Longworth Dames.

D. E. Derry, M.B., Ch.B.

J. Edge Partington.

H. J. Fleure, D.Sc.

H. O. Forbes, LL.D.

E. S. Hartland, F.S.A.

Sir R. B. Martin, Bart., M.A.

H. J. E. Peake.

Carveth Read, M.A.

W. H. R. Rivers, M.A., M.D., F.R.S.

W. W. Skeat, M.A.

Emil Torday.

Lieut.-Col. L. A. Waddell, C.B., C.I.E.,
LL.D.

W. W. Wright, M.B., D.Sc., F.R.C.S.,
F.S.A.

G. Udny Yule, F.S.S.

Professor THANE proposed a vote of thanks to the PRESIDENT for his address, and asked, in the name of the Institute, that he would allow it to be printed in the *Journal*.

The proposal was seconded by Professor W. WRIGHT and carried by acclamation.

The Institute then adjourned.

ANNUAL REPORT FOR 1915.

The Council is happy to be able to report that the Institute has suffered less during the past year than might have been expected. The total membership now stands at 539, as against 544, the figure for the corresponding date last year. This figure cannot, under the circumstances, be regarded as anything but highly satisfactory.

The numerical gains and losses are expressed in the following table :—

	Total Jan. 1st, 1915.	Loss by death or resignation.	Since elected.	Total Jan. 1st, 1916.
Honorary Fellows	43	1	1	43
Corresponding Fellows... ..	1	1	—	—
Local Correspondents	37	2	1	36 ¹
Affiliated Societies	3	1	1	3
Affiliated Members	1	—	—	1
Ordinary Fellows :—				
(a) Compounding	72	1	—	71
(b) Subscribing	399	17	15	397
Total Membership	544	23	18	539

¹ Of these, 12 are also Ordinary Fellows.

The losses which the Institute has suffered through death are the following: Mr. Lucien Carr, Corresponding Fellow; Professor F. W. Putnam, of Harvard University, Honorary Fellow (elected 1892); Dr. R. Bertholon, Local Correspondent in Tunis; Professor R. Meldola, F.R.S. (elected in 1881); Mr. F. W. Rudler, I.S.O., Ex-President (Foundation Member, obituary notice appeared in *Man*, 1915, 18); Major A. J. N. Tremearne, killed in France (elected 1910, obituary notice appeared in *Man*, 1915, 109).

MEETINGS.

The Council determined, under the circumstances, to curtail the number of ordinary meetings as usually held in the course of the year. As a result, 5 meetings took place, at which 5 papers were read: 3 on archaeological, 1 on physical, and 1 on general subjects.

HUXLEY MEMORIAL MEDAL.

The Council decided to suspend the presentation of the Annual Huxley Memorial Medal for this year.

PUBLICATIONS.

During the year two half-yearly instalments of the *Journal*, reduced in size, have been issued, viz., Vol. XLIV, Part 2, and Vol. XLV, Part 1. Of the former, 94 copies have been sold; of the latter, 83. The corresponding figures for 1914 were 110 and 92 respectively: the total drop in the sales amounts, therefore, only to 25, and the sales themselves stand at a higher figure than in 1910. Under the circumstances the Council considers them very satisfactory.

The usual 12 monthly parts of *Man* have been issued. The office sales reach a higher figure than last year, but the subscriptions have somewhat declined, though certainly not to a greater extent than might have been expected.

LIBRARY.

The number of accessions to the Library amounts to 132. The exchange list has been augmented by two British, one Colonial, and one foreign, publications.

The Council judged it unwise to proceed with the publication of the Catalogue for the present.

Mr. Edge Partington has devoted much time to the re-arrangement of the Library ; the tabulating of the blocks used for *Man* has been concluded, and the classification and re-arrangement of the pamphlets commenced. The Council desires to express to Mr. Edge Partington its thanks for the trouble he has taken in the matter.

INTERNAL.

The question of procuring adequate premises for the Institute has again been before the Council, but no definite decision has yet been reached.

The revision of the By-laws was concluded, and the new By-laws are now in force. The Council desires to thank the Treasurer for much time and trouble spent on drafting them in accordance with the new Articles of Association.

As the Hon. Secretary is still engaged in military work in France, the secretarial duties have been performed by Mr. J. Edge Partington and Mr. T. A. Joyce. It has been found possible to dispense temporarily with the services of a boy clerk.

EXTERNAL.

Finally, the Council desires to offer its congratulations to Dr. W. H. R. Rivers on being the recipient of one of the Government Gold Medals from the Royal Society for his research work in Anthropology.

Also to the Hon. Secretary, Capt. T. C. Hodson, for the award by the French Government of the *Palmes Académiques* in recognition of his work as a railway transport officer in France.

TREASURER'S REPORT FOR THE YEAR 1915.

Prior to the commencement of the war in the summer of 1914, the Council had, as I stated in my Report for that year, thought it desirable, in view of the recent increase in membership, and consequent improvement of the Institute's financial position, to adopt a policy of development of its operations ; and though the Council, immediately on the outbreak of war, took steps to meet the changed conditions which it involved by reverting to a policy of economy and caution, most of the increased expenditure for that year had already been incurred ; the inevitable result was a heavy deficiency in the Institute's Revenue Account for the year. It was hoped, however, that the Council would be able, without adopting any very drastic measures, to wipe out the loss, and avoid deficiencies in subsequent years ; it will be seen that there is ground for believing that this hope will be fulfilled, the accounts for the year 1915 showing a surplus of revenue over expenditure of £114 15s. 11d., as compared with the deficiency of £127 6s. 8d. in 1914.

The amount received from current subscriptions in 1915 was £26 more than in the previous year; but this excess is mainly accounted for by the admission in November and December, 1913, of Fellows whose subscriptions, paid in advance, though covering the year 1914, fell into the accounts for 1913. The proceeds of the *Journal* for 1915 were £21 less than in 1914; and those for *Man* were £11 less. The gross revenue was £8 less.

The cause of the improved financial position will be found on the expenditure side of the account. Comparing the more important items of 1915 with those of 1914, we find that rent was £23 less, in consequence of the discontinuance of the use of the lecture hall of the Medical Society of London; the cost of the *Journal* was £142 less; the cost of *Man* £9 less; expenses of printing and stationery were £13 less; the charges for the lantern were £9 less; and the absence of the item of a Huxley lecture involved a saving of £14. The total expenditure for 1915 was £250 less than in 1914, if we include in the amounts for both years the expenditure on the Library.

I think the results for the year, taken as a whole, are most encouraging, as they seem to demonstrate the ability of the Institute to weather the storm through which it and other learned societies are passing.

A comparison of some of the figures for the year 1915 with those for the pre-war year 1913 illustrates the changes in the financial position produced by the war, and the efforts of the Council to meet the situation. The gross revenue from all sources in 1915 was £208 less than in 1913; of this, £111 represented a diminution in the amount received from subscriptions. On the other hand, the total expenditure in 1915 was £253 less than in 1913; and of this diminution £201 is to be attributed to reduction in expense of the *Journal*, which in 1913 had reached a figure very much in excess of those of all previous years. The net loss arising from publication of the *Journal* was only £99 in 1915, as compared with £229 in 1913. We have not, however, quite wiped out the large adverse balance of 1914, and we do not know what further troubles may be before us. I think, therefore, that it is imperative that the economy of 1915 should be continued for the present; and in this view the Council concurs.

I must, however, appeal again to the Fellows to pay their subscriptions. The sum of arrears at the end of 1914 was serious; but it was much more so, about double in amount, at the end of 1915. Many Fellows are engaged on active service abroad, and the Council is not putting pressure upon them. There are, however, many Fellows who have not this excuse, and a number of these are even two years in arrear. I think it is due, not only to the Institute, but to these Fellows themselves, that they should make an effort to pay their share of the expenses of a Society of which they are members, and in the advantages of which they share. I would also point out to these Fellows that by their default they increase the difficulty of the Council in its desire not to press those engaged on active service, the very last thing which any Fellow would wish to do.

ROBERT W. WILLIAMSON, *Hon. Treasurer.*

ROYAL ANTHROPOLOGICAL INSTITUTE

ACCOUNTS FOR

REVENUE

PAYMENTS.	£	s.	d.	£	s.	d.
RENT.....				229	6	0
"JOURNAL"				241	8	9
"MAN"				164	6	11
SALARIES				183	17	0½
HOUSEKEEPING				27	11	11
ADVERTISING				17	17	0
STAMPS AND PARCELS				60	13	6
TELEPHONE AND TELEGRAMS.....				7	12	0½
PRINTING AND STATIONERY				50	4	1½
COAL, GAS, AND ELECTRIC LIGHT				8	14	3
LANTERN				3	3	0
INSURANCE—						
Fire	5	0	0			
Air Craft	12	10	2			
				17	10	2
TRAVELLING				0	17	11
SUBSCRIPTIONS TO OTHER SOCIETIES, DIRECTORIES, ETC.....				7	19	4½
LEGAL EXPENSES				3	13	8
NEW SAFE				6	10	0
AUDITORS' FEE.....				3	3	0
VALUERS' FEE				5	5	0
ADDRESSOGRAPH				0	15	4½
CYCLOSTYLE AND TYPEWRITER				0	7	8
ASSOCIATION FOR PROTECTION OF TRADE				1	4	0
SUBSCRIPTION TO BRITISH ASSOCIATION				1	0	0
REPAIRS.....				0	19	6
POST OFFICE (telegraphic address)				1	1	0
BANK CHARGES				0	15	8
SUNDRIES				4	3	6
TRANSFER TO LIBRARY ACCOUNT.....				2	16	8½
Balance in hand, 31st December, 1915				201	14	9½
				£1,254	11	10½

LIBRARY

BOOKS AND BINDING	£	s.	d.
	2	16	8½

OF GREAT BRITAIN AND IRELAND.

THE YEAR 1915.

ACCOUNT.

	RECEIPTS.	£	s.	d.	£	s.	d.
BALANCE in hand, 1st January, 1915					86	18	10½
SUBSCRIPTIONS :—							
Current		748	11	0			
Arrears		20	1	0			
Advance		18	18	0			
					787	10	0
SALE OF "JOURNAL"					142	6	0
SALE OF "MAN"					159	13	10
SALE OF "HUXLEY" LECTURE					0	14	0
SALE OF OLD PUBLICATIONS					0	1	0
DONATION BY PROFESSOR CARVETH READ					10	10	0
ADVERTISING					9	0	2
DIVIDENDS					57	17	9
SUNDRIES					0	0	3

£1,254 11 10½

ACCOUNT.

TRANSFER FROM REVENUE ACCOUNT.....	£	s.	d.
	2	16	8½

Balances of previous Accounts:					
Revenue Account	201	14	9½		
Capital Account.....	4,965	10	3		
	<hr/>			5,167	5 0½

Bibliography	50	19	1		
Less received in 1915	0	1	0		
	<hr/>			50	18 1
Physical deterioration	6	12	0		
Less received in 1915.....	0	2	11		
	<hr/>			6	9 1
Sir E. Ray Lankester's lecture	22	6	6		
Less received in 1915	0	0	10		
	<hr/>			22	5 8
Coxhead's N.E. Tribes of Rhodesia...	1	17	0		
Less received in 1915	0	0	10		
	<hr/>			1	16 2
Dayrell's "Ikoni Folk Stories"	18	17	11		
Less received in 1915	0	5	3		
	<hr/>			18	12 8
	<hr/>			119	18 6
Deduct Report of Anthropometric Committee.....	4	13	8		
Plus received in 1915	1	15	9		
	<hr/>			6	9 5
Owing by British Association	113	9	1		
" by a Fellow for Author's copies	5	17	10½		
	<hr/>			4	18 0
Cash:					
In Bank.....	133	10	9		
In hand (petty cash)	0	15	2		
	<hr/>			134	5 11
	<hr/>			£5,213	10 8½

ROBERT W. WILLIAMSON,
Hon. Treasurer.

We have examined the Accounts of the Royal Anthropological Institute and have obtained all the information and explanations we have required. In our opinion the Balance Sheet at the 31st December, 1915, is properly drawn up so as to exhibit a true and correct view of the state of the Institute's affairs according to the best of our information and as shown by the books of the Institute.

JACKSON, PIXLEY, BROWNING, HUSEY & Co.,
CHARTERED ACCOUNTANTS,
Auditors.

58, Coleman Street, E.C.
20th January, 1916.

PRESIDENTIAL ADDRESS.¹

ON CERTAIN FACTORS CONCERNED IN THE EVOLUTION OF HUMAN RACES.

By ARTHUR KEITH, F.R.S.

AT the present time we seek to explain the physical characters of many of the races of men now living by supposing that they have arisen by a blending or mixing of two or more well-marked races. The natives of Abyssinia can be best explained by supposing them to be—what they probably are—a blend of Semite and Negro; the natives of Somaliland may be justly regarded as a result of the union of Arab and Negro stocks. Without doubt many of the races found in India, Further India, and in Oceania have been produced by the blending of two or more distinct human stocks. But however much may be the importance we are inclined to attach to “hybridity” as a factor in the production or evolution of human races, we have still to solve the main problem: How were the primary stocks produced—the stocks which we postulate when seeking to explain the origin of hybrid races? That is the problem to which I want to direct your attention in this Address, and although I cannot provide you with a full and satisfactory solution, I am convinced that some of the conditions I am to lay before you will prove to be important factors in determining the origin of new races of mankind.

¹ In the introductory part of his Address, which has been omitted here, because the matters dealt with are already recorded in the Annual Report of the Institute for the past year, the President acknowledged the Institute’s indebtedness to Miss Martindell for the able manner in which she had carried out the duties of Assistant Secretary, in place of her brother, Lieut. E. W. Martindell, who is still on active service, and to the Chairman of the Executive Committee, Mr. Edge Partington. He intimated that the Council of the Institute had received with regret Captain T. C. Hodson’s resignation of the post of Honorary Secretary. Captain Hodson has been on service in France since the commencement of the War. He also paid a tribute to the memories of Professor Rudler (who was one of the few surviving Fellows who belonged to the Ethnological Society, before the union of that Society with the Anthropological to form the present Institute), of Professor Meldola, Sir George Scott Robertson, Sir John Rhys, and of Professor Putnam of Harvard University. He emphasized the loss which the Institute, and also the science of anthropology, had sustained in the death of Major A. J. N. Tremearne, who fell in battle during the attack on Loos.

The part of the world which is to afford us an introduction to the problem lies in the north-east of Scotland—in the valley of the Deveron, a small river which, rising in the Grampians, flows with a northward trend to enter the Moray Firth at the town of Banff. It is an agricultural district, the farms being dotted amongst the woods in the valley and spreading outwards to the bleak and bare uplands, which are completely covered by a fretwork of fields.

A small town of some 2,000 inhabitants, situated within the valley, serves as a centre for the district; there, on stated occasions, people within a radius of some 6 or 8 miles come to transact private or public business. In the valley we speak a broad Scots dialect—one which travellers from the south begin to remark as they approach the Aberdeenshire Dee and which they continue to hear until they have crossed the Spey on their way to Inverness.¹ Those whose ears are tuned to the niceties of speech would be able to observe that we of this valley and district have our little peculiarities in idiom, expression and accent—just enough to suggest a differentiation from the people in the surrounding valleys and districts. I am certain, too, that were a complete survey made of our physical characters it would be found that we were slightly different in stature, head form and colouring from our neighbours. Although the line that circumscribes our district, and marks off our territory from those surrounding us, cannot be drawn with any degree of exactness, yet we are certain it exists. When we cross that indefinite boundary line we feel that we are among strangers. If we should then chance to meet one whom we recognize as coming from our district we are drawn towards him, and he to us—unless both or one of us have been tarnished by an influence which is not native to our district. We often quarrel amongst ourselves, but when our district or its people is slighted by a stranger we are quick to rise in common defence.

In the community I have attempted to sketch for you there are two forces at work which I conceive to be of importance to students of human evolution. One of them is the force which is seeking to isolate the population of that district from those of neighbouring districts: it is at work over every inhabited area of every country, tending to break the population up into local independent communities. The other force at work is that mental quality which may be called clannishness. It seems to come into operation only in the presence of strangers; but in its ultimate effect it tends to secure the isolation and preservation of the community. All the machinery of our modern civilization tends to make the forces I have mentioned inoperative. In the district I have brought to your notice trains come and go, leaving us newspapers, books, and visitors, which draw our thoughts out into a wider world. Our professional men—our clergymen, lawyers, doctors and schoolmasters—are rarely natives; now and again a farm falls vacant, and in those ways new blood may be imported among us. If we could support all the young men and women that grow up in the district, our community could double its population every 30 years; but the surplus population is being constantly shed.

¹ See references at end of Address, No. 1 (Ellis).

In spite of all contrary influences one can still detect a spirit of clannishness and a tendency to isolation in this as in every local community. When we come to investigate the condition of communities living under more primitive conditions we shall see that both of these factors work without trammel, and must be seriously considered in all our speculation as to the manner in which new races of man are evolved.

So far I have drawn on the experience of my boyhood and youth; I can see now, but I was not aware of it at the time, that another aspect of that quality of the human mind I have described as clannishness had presented itself to me during my student days in the University of Aberdeen. We students came not only from the lowlands of the north of Scotland—in which the community I have mentioned to you is situated—but from the highland districts and glens where until recent centuries Gaelic was the prevalent speech. We highland and lowland students could not detect each other by mere personal appearance, but the moment we spoke we knew each other at once. There was no sort of social distinction drawn between us: the Celtic line had little, if any, influence on the friendships formed by students, yet in a collective sense—when we were members of a “herd” or “mob”—a difference was recognized; if a highland student had been impugned it would have been his Celtic fellows who would have rallied to his defence. If a line of cleavage had occurred amongst the students, the line would have followed the Celtic border. Galton (4) has noted that speech is concerned in clannishness. He wrote: “Just as a simple syllable in a sentence pronounced with a foreign accent makes one cease to look upon the speaker as a countryman” (5)—I may also cite the biblical instance where the men of Gilead waited at the “passages of Jordan” and asked each man: “Art thou an Ephraimite? If he said, Nay; then said they unto him, Say now Shibboleth: and he said Sibboleth: for he could not frame to pronounce it right. Then they took him, and slew him.” In that case speech served as a clan mark.

In the instances I have cited from my native country, we see the factors which tend to isolate local communities into independent bodies rendered inoperative by the machinery of our modern civilization. I propose, now, to ask your attention for a moment to another aspect of the same problem: when two well differentiated races come into close contact, what are the forces which tend to prevent their fusion? We may study the problem in the East End of London as well as anywhere else in the world. In the Boroughs of Bethnal Green, Poplar, Shoreditch and Stepney, there are about 65,000 people who were themselves, or whose immediate ancestors were, born and bred in the Polish provinces of Germany, or of Russia. There are clearly certain factors at work which prevent their absorption by our general population. A radical difference in speech may at first tend to isolate them, but in the course of two or three generations the language barrier disappears. The barrier formed by a difference in habits of life and social customs is much stronger and more difficult to overcome than that of language; yet we know that in time this barrier will also break down. Yet it is clear that when these barriers are broken down, and when our East End colony has

become British in speech and in habit, there remains and apparently there will remain some force at work which tends to segregate the members of the colony from the surrounding British people. I believe the force to be the same in nature, the same in its manifestations as I have already alluded to as that felt mutually by lowland and highland Scots—clannishness. The force in Scotland is latent—almost dead; there is no recognizable physical difference between the individual highlander and lowlander; individuals of both groups meet and mix in private life on terms of absolute equality, yet collectively, when masses of both groups are involved, it is easy to suppose, if an occasion were given, the spirit of clannishness might rally highlander and lowlander in opposite camps. Clannishness in its incipient stages, in its lowest grades of development, is a quality not of the individual, but of the mass. In the case I have cited from the East End of London clannishness is a much stronger and more potent force. Here the colonist and the native recognize each other as different by a glance of the eye; with physical differentiation this mental quality which I have described as clannishness has become deeper and stronger. When we set out in search of the organic machinery which has produced new races of mankind in the past, it is useless to seek for them in our European communities. The organization of great masses of people into communities is a late phase in human history; we are going beyond the facts at our disposal when we suppose that communities, such as modern European communities are, had come into existence 10,000 years ago. Yet we do know that in remote times some vital mechanism was at work which separated mankind into such physically different forms that we must regard such types as Neanderthal, Piltown and ours as not only racially but specifically different. Clearly it was not amidst such conditions as now exist in modern Europe that the various races of mankind were evolved. We must go further afield and see what the conditions are amongst what we count the more primitive races of mankind and the higher types of man-like apes. Amongst such forms we want to ascertain how far these conditions or qualities I have described as clannishness and isolation have been effective agents in the production of new races.

In our search for evidence we cannot do better than start with the voyage of the "*Beagle*"; it was that voyage which altered our conception of how new forms of life arise. Christmas of 1831 was just over when the barque-rigged "*Beagle*," of only 235 tons, sailed from Devonport with Captain Robert FitzRoy in command. The four people on board which interest us now are Charles Darwin, aged twenty-two, York Minster, Jemmy Button, and Fuegia Basket. Three were Fuegians whom Captain FitzRoy had brought home from Tierra del Fuego rather more than a year before. By Christmas Day of the following year (1832) the "*Beagle*" rounded Cape Horn, and Darwin made his first acquaintance with the Fuegians in their native territories. "The different tribes," he enters in his diary, "have no government or chief, yet each is surrounded by other hostile tribes, speaking different dialects, and separated from each other only by a deserted border or neutral territory; the cause of their warfare appears to be the means of

subsistence." Some weeks later, when accompanying the boats which were to restore Jemmy Button to his tribe, he makes the following entry (January 22, 1833): "After having passed an unmolested night in what would appear to be neutral territory between Jemmy's tribe and the people whom we saw yesterday, we sailed pleasantly along. I do not know anything which shows more clearly the hostile state of the different tribes than these wide borders or neutral tracts. Although Jemmy Button well knew the force of our party, he was at first unwilling to land amidst the hostile tribe nearest to his own."

Darwin depicts the population of Tierra del Fuego as broken up into a great number of distinctly isolated groups, each numbering from 120 to 150 souls; each group had its own demarcated territory. For how many centuries they had lived thus we do not know, but Darwin observed that the canoes they used were exactly like those Magellan had seen three centuries before the "*Beagle's*" visit. Their mode of living was apparently stationary. We are not concerned now with the factors which maintained the permanency of the local grouping, but every breeder will recognize how favourable such conditions are for the production of well-marked local types. A permanently isolated group may well become the cradle of a new breed.

After landing Jemmy Button in Ponsonby Sound, nearly two years were spent on the mainland of South America before the "*Beagle*" headed for the Galapagos Islands, which were to supply Darwin with the most convincing proofs that the creation of new forms of life had not ceased. The islands are of small size, within sight of each other, about thirteen in number, and situated in the Pacific some 500 to 600 miles distant from the mainland of South America; from the geologist's point of view they are of recent origin, and have never been connected with the mainland. An extract from his Journal shows the importance of this visit:—

"I have not as yet noticed by far the most remarkable feature in the natural history of this archipelago; it is, that the different islands to a considerable extent are inhabited by a different set of beings. My attention was first called to this fact by the Vice-Governor, Mr. Lawson, declaring that the tortoises differed from the different islands, and that he could with certainty tell from which island any one was brought. . . . My attention was first thoroughly aroused by comparing together the numerous specimens of the mocking-thrushes, when to my astonishment I discovered that all those from Charles Island belonged to one species, all from Albemarle Island to another, and all from James and Chatham Islands belonged to a third. . . . I must repeat that neither the nature of the soil, nor height of the land, nor the climate, nor the general character of the associated beings can differ much in the different islands. . . . Reviewing the facts here given, one is astonished at the amount of creative force, if such an expression may be used, displayed on these small, barren, and rocky islands."

Although Darwin demonstrated that insular conditions favour the production of new species, he never raised isolation to an important place amongst the factors which determine the evolution of new forms; but he did regard it as the "corner-

stone of the breeder's art." Moritz Wagner (2) appears to have been the first to insist on the value of geographical isolation as an evolutionary factor: it is to Romanes, however, that we must give the credit of forcing the importance, not only of geographical isolation, but also of other and more important forms of isolation, on the attention of his fellow biologists.

From the voyage of the "*Beagle*" we learn that people living under primitive conditions are isolated into a large number of small definite groups, and that insular conditions are highly favourable to the production of new races and species. When we come to examine the nature of the forces which bind the individuals into a group and isolate that group from all surrounding groups, we cannot do better than follow Darwin's cousin, Francis Galton, in his voyage to South Africa (4) at the close of 1849, when Darwin himself had settled to his life's work at Down. Galton was then twenty-eight. He had been trained for medicine, but his natural tastes were for sport and travel. Early in 1850 he landed at Walfisch Bay, and having fitted himself out with men, wagons, and draught oxen, set out in a north-easterly direction, and penetrated an almost unknown country to a depth of some 500 miles. He noted the tribal arrangement of the people, but his observations which bear upon the problem we have on hand were not made on the native men, but on the native Damara oxen. "The Damara ox," he writes, "manifests little affection for, or interest in, his fellows, yet he cannot bear even a momentary severance from his herd. If he be separated from it by stratagem or force, he exhibits every sign of mental agony; he strives with all his might to get back again, and when he succeeds, he plunges into its middle to bathe his whole body with the comfort of closest companionship" (5). That instinct—the "gregarious instinct"—which compelled the separated one to seek the centre of the herd, was one which had been evolved for the protection of the individual: the animal which strayed soon fell a prey to lions which follow in the track of the herd. Individuals in which a gregarious instinct was feebly developed would fall to the beasts of prey and become eliminated. The herd was kept together by an instinct akin to that of clannishness. Galton also saw that it was necessary that there should be in every herd one or two courageous individuals in which this instinct was less developed, in order that the herd might have a leader. He therefore supposed that evolution so worked on the mass that in every herd of about fifty there would be one or two whose courage and independence had not been swamped by a highly developed gregarious instinct. Galton realized that the observations he made on the Damara herds were strictly applicable to human groups. Thirty years afterwards he utilized them in his *Inquiries into Human Faculty and its Development* (5).

Galton's observations are extremely valuable for us, because he was the first to perceive that in seeking for the manner in which new races arise we must concentrate our attention, not on the individual, but on the local group or herd. He realized, if the gregarious instinct were too strong the herd might grow so large as to exceed the food-supply of the district which it occupied. He realized that if the instinct were too weak the herd would become broken up and exposed to

danger. He observed that the native tribes most liable to dissolution were either very large or very small. "A very small tribe," he writes, "is sure to be overthrown, slaughtered, or driven into slavery by its more powerful neighbour. A very large tribe falls to pieces through its own unwieldiness" (5). Such is Galton's "*law of tribes*."

At this point it becomes a matter of importance to ask: Is the "gregarious instinct" the sole bond which binds oxen into herds and natives into local groups, and separates these herds and groups from all surrounding herds and groups? This question brings us at once in touch with the problems which are engaging the attention of all who are studying the organization of modern peoples. It was fortunate at this point of my inquiries I should have taken up the last edition of a well-known work by a Fellow of this Institute, Dr. Wm. McDougall's *Introduction to Social Psychology* (6). "Although opinions differ widely," writes Dr. McDougall, "as to the form of primitive human society, some inclining to the view that it was a large promiscuous horde, others, with more probability, regarding it as a comparatively small group of near blood-relatives, almost all anthropologists agree that man was gregarious in his habits; and the strength of the instinct as it still exists in man lends support to this view. . . . It seems that the gregarious instinct supplements, as it were, each of the special instincts (sympathy, fear, anger, etc.), rendering complete satisfaction of their impulses impossible until each animal is surrounded by others of the same species." From that statement I infer that Dr. McDougall agrees with Galton in regarding the "gregarious instinct" as the essential bond which binds the individuals of a local group of natives into an isolated community.

It was from Dr. McDougall that I learned of a work which is well known to all students of human society—namely, Professor Giddings' *Principles of Sociology* (7). This author has recognized that the bond which binds the individuals of a local group together, and isolates them from the members of all surrounding groups, is something deeper than merely a gregarious instinct. Professor Giddings is somewhat unfortunate in the name he has selected for that bond; he calls it "consciousness of kind." "The original and elementary subjective fact in society," he says, "is the consciousness of kind." It is clear that Professor Giddings does not mean that one individual by a conscious effort of judgment surveys another individual, and decides rationally that it is or is not a being to associate with. As I read his argument, the action is purely reflex or instinctive; certain impressions are conveyed to the brain by ear, eye, or nose, and the impressions so conveyed determine the disposition or action which follow. Professor Giddings evidently realizes that the bond that ties primitive human beings into local groups is much more than a gregarious instinct: it is of the nature of that mental quality for which I have used the word "clannishness" and to which others have given the name of "race instinct."

I can make my meaning more definite by selecting a specific instance. The hare and the rabbit are members of the same genus; if there be aught of truth in evolution, they are the descendants of a common stock. Rabbits have the

gregarious instinct; hares have not. In a state of nature the rabbit's gregarious instinct never leads it to congregate with the hare's progeny; some deeper instinct than a mere gregarious one keeps the hare and rabbit societies apart. It is to that instinct that I understand Professor Giddings to apply the term "consciousness of kind." In my interpretation, the aversion which keeps the rabbit and hare apart—the "consciousness of kind"—is that form of brain reaction which I have called clannishness in its incipient stage, "race-instinct" in its more developed form, and inter-species aversion in its final and fixed state.¹ Those who are familiar with the behaviour of herds of cattle will at once recognize that a "gregarious instinct" does not explain the isolation of a herd or a local group. When the farmer turns a few strange oxen into a field where his main herd is grazing, the strangers are not allowed to mix with the main herd at once—although the gregarious instinct is strongly developed both in the main herd and in the added strangers. The strangers are "nosed" all over, they are butted, flouted and chased, and even three days later or more will be found forming an isolated group in the field. In time they become members of the herd and are then ready to resent the further addition of strangers. The instinct is one exercised through the senses of smell, sight, and hearing; it is of the same nature as that human reaction to which I have given the name of clannishness. *Clannishness is the incipient stage of specific aversion.* In the human mind, where old instincts are constantly being brought up before the judgment seat of consciousness, a constant war goes on between what we think is just and right and what some unreasoning impulse seems to force upon us. Therein lies the problem of "race caste."

The year following the return of Galton from Damaraland, a young man, Paul Du Chaillu, destined to give us our first intimate glimpse of the conditions of life among man-like apes, landed on the west coast of Africa to take up his life in a district some 1,500 miles to the north of the region explored by Galton. His observations, published in 1861 (8), were at first received with scepticism. He found that gorillas and chimpanzees lived in small isolated family groups. The gregarious instinct was scarcely present among gorillas. Of especial interest to us in our present search are the characters which he selected to distinguish one race of chimpanzee from another. The three races he distinguished differed as regards depth or degree of pigmentation, in facial features, hair distribution and tone of voice and kind of call. We employ the same characters to distinguish the various

¹ I have purposely selected the rabbit and hare species to illustrate the meaning I attach to gregarious instinct and "recognition of kind" instinct. The species are closely related in descent: both have the "recognition of kind" instinct, but only the rabbit has the "gregarious instinct." It is clear, however, that the first is the primary instinct; before individuals of the same breed can congregate in herds, they must have recognized each other as members of the same kind. "Clannishness" represents, I believe, a compounding of the two. An aberration of the gregarious instinct is seen in composite flocks of starlings and rooks, or of starlings and sparrows.

racess of man. He found that these chimpanzee races, if not actually living side by side, certainly were inhabitants of the same region. The various races of a region evidently did not intermingle, but bred true to their kind. We must suppose that in each chimpanzee race there had been evolved that form of instinct which Professor Giddings has named "consciousness of kind," and which I suppose to be of the same nature as "clannishness." Du Chaillu saw only one kind or race of gorilla, but in more recent years Lord Rothschild has distinguished five races, each confined to a definite geographical area. Amongst anthropoid apes, then, isolation occurs: each district or region has its particular breed or race of gorilla. At the present time more than a dozen races of chimpanzee have been described. To obtain more definite evidence of the local formation of anthropoid races it is necessary to make a journey to the Far East and examine the conditions under which orangss live in the heart of Borneo. Dutch Borneo is crossed from west to east by the equatorial line; north of that line lie the jungle-covered ranges of hills which separate Sarawak from Dutch territory. From the southern flanks of those hills certain considerable streams flow southward to join the Kapuas river, which flows westward, almost parallel to the equator, reaching the west coast at Pontianak. Between the tributaries issuing from the southern flanks of the hills lie the territories occupied by orangss. The streams serve to isolate the orang territories; orangss cannot swim. It was to this region that Dr. Emil Selenka, Professor of Zoology in the University of Erlangen, came in 1892 with his troop of hunters (9). He was then a man of fifty, and had the air and appearance of an artist from Paris. His main interest was embryology: a visit to Brazil had impressed on him the importance of a study of the embryology of apes; he saw that such a study could throw light on man's origin. He had made a preliminary visit to Java in 1889; his present journey to the Kapuas region had as its main aim the collection of ape and anthropoid embryos, for at that time our ignorance of the development of the higher primates was complete. We may regret that his zeal for science blinded him to a precious form of life which is hastening to extinction, but we must also acknowledge that we owe to him a store-house of exact knowledge. We are only concerned at present with his observations on the distribution of orangss along the territories of the Kapuas basin. When he came to examine the skulls and skins collected from various regions he found it possible to distinguish seven territories, each with its local race of orangss. It was not possible to tell, from a single skin or a single skull, what area the animal had come from, but collectively the skulls and skins gathered from one area differed from those gathered from any one of the remaining six areas. One race differed from another in the average size of brain, the prevailing colour of the hair, the presence or absence of cheek-pads, the degree to which the last molar tooth is developed. These are characters which are known to present a high degree of variability from one individual to another. From Selenka's observations we can conclude that among orangss there is a tendency to split up into local races, the territory occupied by one race being more or less isolated by geographical boundaries from the territory of the adjoining race. Geographical isolation

favours the production of new races. We also conclude that in the territories occupied by primitive forms of mankind a similar factor would be at work.

Long before the date of Professor Selenka's expedition, Dr. Charles Hose, then in the service of the Sarawak Government, had been applying himself, in the intervals of administrative duties, to a close study of the people, the fauna and flora of North Borneo. In 1912, collaborating with Dr. William McDougall, he issued a standard work on the races of Borneo (10). Of the six divisions into which these authorities separate the natives of Borneo, only one is of direct interest to us at the present stage of our inquiry. In their sixth division the authors include all the wandering, nomad, hunting people who inhabit hilly central districts and collect the natural produce of the jungle for purposes of barter with the more civilized Bornean tribes. Of all the peoples in Borneo the central hill people has the best claim to be counted the original inhabitants. They occupy the Kapuas districts from which Professor Selenka collected his orang specimens. Dr. Hose is of opinion that there may be 100,000 of those central nomads or Punans. They have no boats; they grow nothing; they build only rough temporary shelters. They move about in groups of 20-30; they spend a few weeks in one place and then move on to another, but their wanderings are generally restricted to the same area—situated between the upper tributaries of a river. They are peaceful people, but each group is prompt to avenge an injury to one of its members inflicted by a member of another group or of another tribe. The local groups form units of larger territorial groups, each of which has its peculiarities of dialect and custom. Each local group "is generally made up of a chief and his descendants." Each group has its recognized territory.

From an evolutionary point of view the "social" condition among the Bornean nomads is not very different from that amongst the orangs. There is the same separation into local groups, the restriction of those groups to certain areas, the same tendency to the production of local types or races. When we compare the conditions existing in the central jungle districts of Borneo with those observed by Darwin in Tierra del Fuego, we note that there is the same sharp separation of the people into local groups, but amongst the Fuegians the local groups are much more sharply isolated owing to the fierce enmity which existed between the inhabitants of neighbouring areas. The clannish instinct, both in its defensive and offensive effects, reaches a higher and fiercer development among the Fuegians.

In our search for the evolutionary conditions prevailing in primitive communities we naturally turn, at an early stage of our inquiries, to the great insular continent—Australia. It was under the ægis of a zoologist we paid a cursory visit to Borneo; in our visit to Australia it is again a zoologist—Professor Baldwin Spencer, of the University of Melbourne, I propose to take as our guide. His work among the native tribes was inspired by the doyen of British anthropologists—Tylor of Oxford. Towards the close of last century, a partnership, most profitable for the progress of anthropology, was formed between Professor Spencer and the late Mr. F. J. Gillen, special magistrate and sub-protector of the

aborigines of South Australia. The result of that partnership (11) was to throw a belt of light right across the continent from north to south—following the overland telegraph route. Not far from the centre of the Spencer-Gillen belt lives the Warramunga tribe. The territory of the tribe is sharply delimited; we are not told the size of its territory, but from Professor Spencer's map and description we may infer that it amounts to about 8,000 or 10,000 square miles—at least equal in extent to Yorkshire and Lancashire combined. There is every reason to suppose that the present boundaries of the Warramunga territory have remained unchanged for many generations. Their country is an arid plain, covered with Mulga scrub, crossed by ranges of hills and provided with no natural frontier barriers. The visitor is puzzled to know how the natives manage to obtain a livelihood in a region so obviously barren, for the natives depend entirely on the natural produce of their arid plains and almost waterless creek-valleys. The population is divided into local groups of small size, each of which wanders over a definite tract of territory. The individuals of a local group are closely related, the elder men acting as heads of the group. A line may be drawn across the Warramunga territory so that the local groups which constitute the tribe fall into a northern moiety and a southern. Each moiety takes a definite part in the performance of tribal ceremonies. A common speech prevails throughout the members of the tribe with a tendency to the formation of local dialects.

The Warramunga are surrounded by five other tribes, each of which has its marches strictly delimited. Each has its own tongue; in ceremonies and beliefs each tribe differs in detail. A strict understanding of territorial limits, a decided difference in speech, a difference in customs, habits, beliefs and ceremonies, tend to isolate the various tribes. Marriage across the tribal frontier line is rare; organized warfare of one tribe against another is unknown, but vendettas across the frontier line serve as an active force to prevent inter-tribal fusion. Properly accredited messengers, observing all the etiquette of their office, may pass from tribe to tribe. The Warramunga is but a sample. The native population of the whole of Australia is thus grouped into isolated territories under the conditions which we suppose to be favourable to the production of new physical types or races.

How do the Warramunga compare in physique with their neighbours? On their southern frontier they march with the Kaitish tribe; their average stature is considerably greater than that of the Kaitish tribe; they are, as one would suspect, appreciably different in physique. One has to remember, however, that the march between the Warramunga and Kaitish tribes is more than a mere inter-tribal frontier: it is the dividing line between two groups of tribes. The Kaitish is the farthest north of the four tribes which Spencer and Gillen have brigaded together to form the Arunta nation. Thus in Australia we must recognize at least two frontier lines which are of importance to the student of evolution—the definite line which limits the tribal territory, and the less definite line which circumscribes the group of allied tribes. In Professor Spencer's picture of the central region of Australia we seem to see the same tribe occupying exactly the same territory for

countless generations: from an evolutionary point of view, if the white man had not arrived, the tribal organization and distribution would have remained stationary. The mere fact, however, that we find certain groups of tribes which show affinities in features, in speech, and in customs and ceremonies, shows that evolution must have been at work. One cannot explain such tribal resemblances, except by supposing that all the tribes manifesting them had been evolved from a common tribe or stock.

The Warramunga, which has been cited to illustrate the isolation of Australian tribal life, lives in the northern central region; if instances are cited from the eastern and western shores of Australia, it will be found that there is the same degree of tribal isolation. On the eastern coast of Queensland, about 100 miles to the north of Brisbane, lived the Kabi tribe, which has been studied and described by the Rev. John Matthew (12). It occupied a very large tract of country stretching for about 175 miles along the coast and extending over 100 miles inland. The tribe was made up of about 16 local groups—closely related families, each wandering over a definite part of the tribal territory. All the local groups were bound together by a common speech, but there was a distinct tendency to local and individual peculiarities in its usages. The local groups met for tribal ceremonies, which served as a tribal bond. Another binding force was the class system, into which every Australian tribe is divided—every individual in the Kabi country is born or adopted into one of the four classes of the Kabi tribe. A neighbouring tribe, the Wakka, spoke a distinct but kindred dialect; it had the same class system, the same ceremonies, and between the tribes there was some degree of friendliness, communication and intermarriage. Mr. Matthew asserts that it was impossible to distinguish a member of the Kabi tribe from a member of the Wakka tribe by any difference in physical appearance; nor did they differ to any appreciable degree from natives of Victorian tribes. On the east coast the degree or duration of tribal isolation had not been sufficient to produce an appreciable physical differentiation in the bodily characteristics of the tribes. The isolation of the East Queensland tribes was further secured by the treatment of strangers or uninvited visitors: unless the visitor could claim a relationship to some member of the tribe, his life was forfeited.

The west coast of Australia is over 2,500 miles distant from the east, but the tribal arrangements are the same as on the east. In a recent number of our *Journal* (13) Mr. A. R. Brown records his observations on three tribes of Western Australia, one of them being a coastal tribe—the Kariera. This tribe occupied a territory equal in extent to one of our large English counties—a country now parcelled out into sheep stations. Less than a hundred members of the tribe now survive. The territory of the Kariera had most definite boundaries; there were four neighbouring tribes. The Kariera never went to war as a united tribe, but local groups kept up vindictive strife with local groups of the neighbouring tribes. Even now, on the squatters' stations, a native shepherd will not accept service outside his tribal limit, or even outside his group locality, so strictly were the frontier limits

observed in former times. Mr. Brown found that the Kariëra tribe had been made up of about 20 local groups—family groups, each numbering about 30. The district of each group was sharply demarcated; over that district the members of the group wander, hunt, and gather a scanty livelihood. The family group was identified with its district; it was there that every member of the group wished to die. A man was born into his group and into his tribe, and he could not exchange his natal status. The groups were welded into the tribe by a natural system of kinship. Every member of the tribe could address another member in the terms of kinship. If he could not claim or prove a real kinship—a real blood-relationship—then he could be nothing else but a stranger, and a stranger was regarded as a positive enemy. The tribe was a close corporation. The members of the tribe were bound together by an acknowledged kinship, by a common dialect or speech, by a common observance of the hundred and one points of etiquette which serve to form a common tribal organization. The observances which bound the members of a tribe together isolated them from all surrounding tribes. The conditions of tribal life were just those which should give heredity full play in the production of well-marked physical types.

If, then, we try to form a picture in our minds of what life was like in Australia before Captain Cook visited its shores only 146 years ago, we see it as a continent of innumerable tribal islands, each island carrying its own scanty population, each semi-isolated from its neighbour, each the possible cradle of a new physical type. Once these tribal islands are produced, it is easy to see that jealousy of the tribal frontier—a community of speech—a community of belief and of custom, will bind the individuals of each tribe together and separate them from all the neighbouring tribes. But how did the tribal limits come to be demarcated? How did the individuals become drawn together to form a tribe? Professor Baldwin Spencer(11) has advanced an explanation: he supposes—on very good evidence—that the arid plains and steppes of Central Australia were in former times (Pleistocene) well watered, fertile, and carried a large population—much larger than in the pre-Tasmanian period. That, when the rainless period set in, owing to certain physical changes leading to the central elevation of the continent, the population, at one time widespread, became drawn towards certain points—tribal points. There was a movement of the population to certain centres, these centres becoming the home or site of tribes—that is Professor Spencer's explanation. But we have seen how the nomad inhabitants of Central Borneo are gathered into family groups and tribes in a moist, fertile, jungle country, and how the natives of Tierra del Fuego have become arranged in tribal groups. It is clear that Professor Spencer's explanation cannot be applied to the primitive inhabitants of either Borneo or Tierra del Fuego. The theory which Galton evolved to explain the behaviour of the Damara oxen seems to meet the case much better. The grouping of individuals is not the result of external conditions, but of an internal bias or instinct which has been evolved for the preservation of the species. It is more than a gregarious instinct that builds up the local groups; it is an instinct

which selects individuals of the same kind living in the same locality—clannishness or the clan instinct: the “tribal instinct.”

Galton has defined the limits to which that instinct will work effectively: it will cease to be effective when the local group exceeds the limit of the food supply of its territory; when that limit is surpassed, the surplus individuals of the local group must swarm off into new territory or perish.

I wish to lay a special emphasis on the manner in which the native Australians were grouped before we white people invaded their country. We have every reason to suppose that the local and tribal grouping represents an organization which has existed since a very early stage in man’s evolutionary history. It is in a tribal grouping of mankind that we have to try and reconstitute the conditions under which modern races of mankind were evolved. However much we may be inclined to suppose that the Australian tribes were in a stationary condition when Cook first visited them, a wide survey of the tribal conditions in all parts of the continent will convince us that such could not have been the case. Recently Mr. Gerald C. Wheeler (14), of the London School of Economics, has made a very useful survey of literature bearing on the social organization of Australian tribes. The unit in all tribes he finds to have been the local group. It was often difficult to decide, however, whether the local groups inhabiting a wide district were to be regarded as forming a large tribe subdivided into a number of sub-tribes, or whether each sub-tribe was to be regarded as an independent tribe. If evolution were at work—if in the semi-isolated local groups of a district there was a natural tendency to evolve a modification in speech, in custom and in build of body (and we know that such tendencies are always present), and at the same time a high degree of fertility, then we ought to find all forms of transition between an ill-defined sub-tribe and a group of clearly defined and yet closely related tribes. That is exactly what a survey of the tribal organization of Australia does show us. There are records of a growing tribe demanding increase of territory from their more stationary neighbours, but I cannot find a single record of the fusion of two or more tribes.¹ Each tribe strove to prevent intermixture. “Should blacks at any time come on a man with whom they were unacquainted, they invariably killed him if possible. Strange children were killed in a like manner” (Curr). There are also records of tribes which dwindled and died out before the white man had made his presence felt. Although we must presume that the total population of Australia—probably about 150,000—was stationary before the arrival of the whites, we must also presume, from the condition of the tribes, that a slow evolutionary process had been at work.

One cannot help marvelling that the Australian aborigines, organized as a myriad of separate and independent tribes, contrived to remain masters of their continent until so late a date in human history as the 18th century. Their eastern,

¹ The Biduelli, who inhabited a barren district in Eastern Victoria, may prove an exception. They were believed to be an amalgam formed from three adjacent tribes.

southern, and western shores were widely cut off by sea, and consequently safe, but their northern coasts projected dangerously near to New Guinea, and to the lands which lie east and west of New Guinea. They owed their immunity from invasion to two circumstances : neither the Australian aborigines nor their territories could offer anything which could tempt an invader ; the second and more important circumstance was that the tribes along the northern shores are the fiercest and most warlike of all the Australian tribes. They attacked and slew all who landed on their shores and thus shielded the weaker inland tribes. The fierce northern fringe formed an impassable boundary. Recently Professor Spencer has visited the tribes of the Northern Territory (11*b*), and the observations he made on the social organization of the inhabitants of Melville Island have a very direct bearing on the problem we are now discussing. Melville Island is clearly visible from the mainland at Port Darwin. In extent it is about the size of Kent, closely wooded, low lying, and yielding the natural produce of a tropical jungle country. The men of the island are tall, finely built athletes, fierce and inhospitable towards strangers. They differ appreciably from the people on the mainland. They live in isolated local groups ; Professor Spencer's map shows ten such groups placed at intervals round the coast of the island with one inland local group. All the groups speak the same language, but there is no class or clan organization which, as is the case on the mainland, serves to bind local groups into a tribe. Apparently neighbouring local groups occasionally meet, and it is surmised that intermarriage takes place between neighbouring peoples. Each local group lives inside its own territory : they live a nomadic life, building merely temporary shelters and trusting to the natural produce of their locality for a sustenance. Since neighbouring tribes intermarry—at least Professor Spencer has reason to believe this to be the case—then we must regard all the eleven local groups as forming an isolated community—an evolutionary unit. The Islanders take every means to prevent intermixture. We have seen that a distinctly marked variety of the Australian race now inhabits Melville Island.

Melville Island lies a considerable distance to the west of the Gulf of Carpentaria ; it is to the eastern side of that gulf that Australia makes its nearest approach to the mainland of New Guinea. Torres Straits, at the narrowest point, is not much more than 100 miles wide, and is studded with islands. In the islands situated in the narrowest parts of the straits—directly to the north of Cape York Peninsula—the people speak a language of the Australian type, but in the smaller islands lying in the opener part of the straits towards the east the people use a speech which is a Papuan language similar to that spoken in the estuary of the Fly River, on the opposite New Guinean shore. It is to the people of one of these small eastern islands—volcanic in origin and forming the chief of the group known as the Murray Islands, to which I now wish to direct your attention. In its longest diameter it is less than three miles, and at its widest cannot be much more than a mile. There are about 400 inhabitants living in villages scattered along its coast line. For some decades it has been the scene of missionary enterprise ; natives of the South Seas, drawn to Torres Straits on fishing and trading excursions, often visited Mer, and

sometimes married and settled down there. It was on this island that a past-president of this Institute, Dr. A. C. Haddon, spent five months in 1888—an event which, by reason of its ultimate results, must be counted as one of the most important in the history of British Anthropology. Dr. Haddon then held the chair of Zoology in the Royal College of Science, Dublin; he had to teach his students about coral reefs and marine zoology; at a personal sacrifice, he went out in 1888 to Torres Straits to obtain a first-hand knowledge of what he had to teach his students. As he carried on his marine investigations at Mer, he realized that the coral zoophytes could be investigated at any time in any future century, but that in the Torres Straits a phase in the history—in the evolution of man—was being blotted out, and if it was to be studied it had to be done forthwith. A visit to Mer converted a good zoologist into a leader in Anthropology. It was not until ten years later (1898) that Dr. Haddon succeeded in gaining the ways and means to return to Mer. He induced a group of young men to accompany him, who have proved to be the pioneers in the most progressive and profitable movement in the whole history of British Anthropology.

It was because of that visit to Mer that we have two classical examples of how a primitive people should be investigated: *The Todas* (1906) and the *History of Melanesian Society* (1914), by Dr. W. H. R. Rivers. Without that visit we should not have had *The Veddars* (20), *The Melanesians of British New Guinea*, nor the *Tribes of the Sudan*, which Dr. and Mrs. Seligman have given us; unless that visit had been paid, our leading authority on the languages of the Australasian region—Mr. Sidney Ray—would never have been brought face to face with the natives who spoke the languages he has done so much to systematize; we probably should never have had the *Pagan Tribes of Borneo*, by Dr. Charles Hose and Dr. Wm. McDougall; we certainly should not have had the *Studies on the Australian Tribes*, by Mr. A. R. Brown, nor the valuable work which the Treasurer of this Institute, Mr. R. W. Williamson, has given us on the *Mafulu People of New Guinea*. Nor must I forget the anthropological investigations which Dr. Chas. S. Myers carried out on the natives of Egypt; the inception of that research, I dare suppose, dates from the time he formed a member of the Cambridge Anthropological Expedition to Torres Straits in 1898. It is therefore but natural that we should turn to the Island of Mer, classical in an anthropological sense, when searching for the factors which are concerned in the evolution of human races.

Although the Island of Mer is only a little over a hundred miles distant from the mainland of Australia, a distance easily within the sailing capacity of the islanders' canoes, it presents us with a totally different world so far as the conditions of human life are concerned. On Melville Island each local group wanders over its wide tract of country and gathers what nature affords, but on the small Island of Mer each local group has built a village on its own well-defined strip of coastal territory; each house has its fenced garden; from their gardens and from the sea they have a sure means of subsistence. The island would scarcely afford subsistence for a single family living after the nomad manner of Australian

natives; but as things are, it is sufficient to maintain the members of twenty-two village communities scattered round its coast-line. Each village community, although independent, is not, from an evolutionary point of view, an isolated unit. Dr. Rivers (15) collected the genealogies of seventy-three families, in which 397 marriages were recorded. In not a single case did husband and wife belong to the same village community; the various village communities are therefore related in descent, and from our point of view the whole population of the island may be regarded as a single evolutionary unit.

If Mer were completely separated from the rest of the world it would provide us with an excellent opportunity of testing how far isolation conduces to the physical differentiation. I think Dr. Haddon was the first to detect the westward drift of the Melanesians along the shores of Torres Straits. The Melanesian became the dominant sea-power in the straits. The more one studies sea-power the more one finds it to be a powerful and often a perplexing factor in racial evolution. Dr. Rivers found that in 11 per cent. of marriages in the Island of Mer either the husband or the wife was an outsider. There has been thus a steady influx of strange blood. Yet it must not be thought that in the olden times anyone could land and settle in Mer; in old sailing instructions mariners were warned against the natives of the island. They had implements of war, they were "head-hunters," and would certainly have defended their homes from an invader. Our brief survey of Mer shows us that the conditions under which human races are evolved underwent a revolution with the introduction of agriculture into a community, and that sea-power and trade tend to break down those barriers with which a tribe—which is an incipient race—encompasses itself.

The people of Mer speak a Papuan language; the main or western part of British New Guinea, which lies a hundred miles to the north of this island, is the home of the Papuan tongue. It is probable that, at one time, all the natives of British New Guinea spoke a Papuan language, but at the present time its southern coast, eastwards of the St. Joseph river, is fringed by peoples speaking Melanesian dialects. It is to the condition of the people living along a part of this shore—the region adjacent to Port Moresby—that I want to direct your attention for a moment. My reason for selecting the coast region is a double one: (1) because the conditions under which its people live have been investigated by Dr. C. G. Seligman (16); (2) because it gives me an opportunity of removing a false impression which my cursory survey of Mer may have created in your minds. I have said that the twenty-two village communities of Mer must be regarded as a single evolutionary unit or tribe; the idea may have occurred to you that however large the island, and however numerous its village communities, the result would have been the same. An examination of the organization of the communities along the coastal region on either side of Port Moresby shows that with enlargement of territory there is always a subdivision into tribal communities—each community speaking its own dialect, practising the same customs, meeting together as

participators in common ceremonies, and regarded by themselves and by neighbouring and usually unfriendly communities as forming an entity. A stretch of forty miles of coast at Port Moresby is occupied by a Papuan-speaking tribe, the Koita; their territory is divided into thirteen sections; in each section there is a village community. Each village community is jealous of the hunting rights of its territory; its garden lands are parcelled out. Each village community is an independent unit, but as there is intermarriage between adjacent communities we must regard all thirteen village communities as forming an evolutionary whole. The neighbouring village tribes, living in the hinterland and in the coastal region on each side of them, are separated from them by speech, custom and feud. When tribes settle down to till the soil on which they live the tribal barriers are not broken.

The relationships which Dr. Seligman found to exist between the four villages which constitute Port Moresby are very remarkable and have a direct interest to the student of human evolution. The villages of Port Moresby are placed close together; the two more inland villages are inhabited by the Papuan-speaking tribe just mentioned—the Koita; the two placed on their seaward side are inhabited by a Melanesian-speaking tribe—the Motu. There is a clearly drawn line between the Koita and Motu peoples. They are separated by speech and custom, but they are friendly and intermarry. How this juxtaposition of two peoples came about and how long it has existed we cannot tell. I do not think that the Koita and Motu people are distinctly differentiated by physical features; the main interest of the case for us is the proof that the fusion of two allied races, once they have become separated by speech, custom and belief, is not easily brought about.

Although Borneo lies some 2,500 miles west of Port Moresby, I cannot refrain from citing the even more remarkable relationship which Dr. Hose⁽¹⁰⁾ observed amongst native Bornean tribes. The Punans, the central nomad tribe, has been already mentioned; another tribe, the Sea-Dyaks, or Ibans, occupy coastal or estuarine districts. Along the river banks, on the reaches between the central hilly districts, which are roamed over by nomad tribes, and the coastal strips, occupied by Sea-Dyaks, there are to be found village settlements—village communities of four other tribes—Kayans, Kenyahs, Klemantans, and Muruts.¹ Each of these tribes speaks its own tongue and has its own characteristic beliefs and customs; all of them are members of the Malayan racial type and yet, in a stretch of 20 miles of a Bornean river, village communities belonging to each of these four tribes may be encountered. There is no chief at the head of the tribes: there is no central organization to co-ordinate the actions or regulate the behaviour of any tribe to another, and yet each village community retains its own individuality and is instinctively conscious that it is a unit of a scattered people. Physically, the members of those four scattered tribes are not materially different from one another, and yet there is some barrier which prevents a fusion of their intermingled communities. The barrier of speech, custom, and tradition assist, but I think we

¹ Dr. Haddon informs me that the Muruts are more Indonesian (dolichocephals) than Malayan (brachycephals).

must seek for more potent forces than these, and the deeper and stronger force I would indicate is that instinctive quality I have alluded to as clannishness, the "tribal instinct." Is not this instinct the same as that which makes individuals of allied species avoid each other?

The interesting condition of the native tribes of Borneo tempted me away from Port Moresby; I propose to return to the Melanesian shore of New Guinea and take up again the thread of my argument. Along that shore we have to deal with village communities exposed to all the influences exercised by a native race which is in command of sea-routes. We want to know the conditions under which the sheltered inland tribes of New Guinea live. It will be remembered that the St. Joseph river, which rises in the hilly region in the eastern centre of the island, flows southwards, its estuary marking the western limits of the Melanesian-speaking tribes. In 1910, the Treasurer of this Institute, Mr. R. W. Williamson, visited a people or tribe living in the hilly region at the headwaters of the St. Joseph—the Mafulu, and has given us one of the most accurate and useful descriptions of a native people that I know of (17). The Mafulu live in small village communities, their scattered hamlets straggling along jungle-covered hilly ridges. The territory belonging to each community, which occupies two to eight villages or hamlets, is accurately defined; its members are careful to protect their hunting and fishing rights over their territory; the members of each community meet for ceremonial feasts or to form hunting or fishing parties. Each member of the community tills and enjoys his own garden land. He owns his house. The members of each community are separated into distinct classes or clans, each class of the community occupying its own separate village or part of a village. All the Mafulu communities are linked together by a common language, although the dialect of one community may differ from that of its neighbour. But there is no central organization or supreme chief. The communities never combine for common defence; there is no organized war between the Mafulu people as a whole and a neighbouring people as a whole. On the other hand, there are standing enmities between certain village communities, but those enmities are most fierce and most frequent which exist between a frontier Mafulu community and a frontier community of a neighbouring people.

The exact dimensions and population of the Mafulu country we have as yet no means of estimating with any degree of certainty, but on the evidence of Mr. Williamson's map I infer that it includes an area of about 150 square miles—about the size of Rutlandshire. From the accounts given us by those who have explored New Guinea, we have every reason to suppose that the whole of that great island is demarcated into definite tribal areas, each inhabited and claimed by a native people. As in Borneo, the tribes which occupy the central mountainous areas of New Guinea are composed of nomadic local groups, but by far the greater part of its population form village communities, comparable in their tribal grouping to the Mafulu type. Along its coasts are to be found the hybridizing and colonizing effects of sea-power. At first sight the condition of human society in

New Guinea seems radically different to that which extends throughout the neighbouring continent of Australia, yet from the point of view we have in mind, they are very much alike. Australia and New Guinea represent a mosaic of tribal territories; the native tribal organization works so that the inhabitants of one territory are automatically isolated from the communities living in adjacent tribal areas. Each of them, from an evolutionist's point of view, represents the possible cradle of a new race. Both Dr. Seligman and Mr. Williamson cite village communities and tribal communities which have increased rapidly in recent years; they also give examples where corresponding units have been exterminated or died out. Evolution is certainly at work in the native population of New Guinea.

Before leaving the Australasian region I find it necessary, for the sake of my argument, to draw your attention to a very interesting paper on the tribes of Timor, contributed to the Proceedings of this Institute over thirty years ago by one of its most distinguished Fellows, Dr. H. O. Forbes (18). Timor lies about 1,000 miles to the west of New Guinea, a little more than 300 miles to the north-west of Melville Island with its scattered local group of natives. In 1883, Dr. Forbes visited the eastern end of Timor, that part having been a Portuguese possession since the sixteenth century. East Timor he found was divided into forty-seven districts; each had its rajah or chief; the natives, whom Dr. Forbes regarded as allied both to Malays and to Polynesians, lived in house clusters—village communities. Each district represented an independent state. In the relatively small area covered by these forty-seven states there were as many as sixteen dialects in use. The Timor chiefs combined for war. The condition in Timor I am inclined to regard as a further development of the New Guinea condition as depicted for us by Mr. Williamson in the Mafulu people. The tribal organization has been improved, a hereditary chieftainship has been evolved, but the tribal isolation has not broken down.

About the time Mr. Williamson was returning from his expedition to the Mafulu, Mr. T. C. Hodson, whose services to this Institute as its Honorary Secretary we all regret to lose, was writing his authoritative monograph on the tribes of the Nāga Hills (19). The jungle-clad Nāga Hills, situated in the northern part of the native state of Manipur, and not far from the frontier line which separates Assam from Burmah, are 4,000 miles from the New Guinean hills on which the Mafulu people live, and yet the picture of the Nāga village—straggling along the ridge of a hill—given us by Mr. Hodson is almost identical with the description of the Mafulu village given us by Mr. Williamson. Mr. Hodson is emphatic in regarding the village community as the social unit; the village communities of a certain area formed a people or tribe, just as the scattered village communities formed a people or tribal community. In neither case was there a central organization for moving the village communities to act together in offence or defence. Mr. Hodson describes seven Nāga tribes or tribal communities in the state of Manipur. The villages within each tribal territory are united by a community of speech and by inter-marriage; they are separated or demarcated from the village communities of

surrounding tribes by a disparity of speech and by a distaste for inter-tribal marriages. We have, then, in the Nāga Hills and in the great territorial areas which surround the Eastern Himalayas, the same form of evolutionary organization in human society as we have already seen in Australasia. It was my intention, if space and time had permitted, to use the observations made by Dr. and Mrs. Seligman (20) on the Veddas of Ceylon, and by Dr. Rivers (21) on that strange pastoral people—the Todas—who occupy an isolated plateau at the southern end of the Nilgiri Hills in Southern India. But I have exceeded both the limits of space and time, so I must draw towards an end; I will merely state that, for the purposes of my argument, the Veddas, who represent an almost extinct people, had been composed of local nomad groups and that these groups had formed tribes occupying a definite territorial area. The Todas interest us from another point of view: they are a people with clearly defined physical characters; they maintain their tribal isolation in the presence of two other and more numerous peoples who share the plateau—about one-third the size of Kent—with them. Are differences in speech, in custom, and in belief sufficiently strong forces to preserve their social isolation? I think we have to seek deeper. There is the clannish instinct.

The anthropologists of India have provided a mine of wealth for the student of human evolution. The writings of our former President, the late Sir Herbert Risley, and those of Mr. W. Crooke (22), Mr. Edgar Thurston (23), Mr. H. A. Rose, and many other Fellows of this Institute, provide us with an abundance of material. As we move westwards for a passing glimpse at certain African tribes, I can only mention Mr. Longworth Dames' monograph on "The Balochi Race," Sir Mark Sykes' (24) description of the 300 Kurdish tribes found in the Ottoman Empire. Nor need I remind you that we have a detailed and invaluable account of a tribal organization which existed in Palestine some 3,000 years ago, in the Book of Judges.

In Africa, as in India, the Fellows of this Institute have provided the student of evolution with a wealth of material. Crossing the Red Sea to the Egyptian littoral, we meet with the seven Hadendoa tribes described by Dr. Seligman (25)—nomad pastoral tribal communities, warlike and jealous of their frontiers. I must pass by an interesting paper on tribes of the Bahr-el-Gazal by our distinguished Fellow, Major S. L. Cummins (26), excellent accounts of Central African tribes by the Rev. J. Roscoe, the Hon. K. R. Dundas, Mr. Northcote W. Thomas and many others. I must also leave untouched the many and valuable contributions which Sir Harry Johnston (27) has made to our knowledge of the Ethnography of Central Africa—scene of a fierce and continuous struggle between tribes and tribal organizations of several rival negro or negroid stocks and presenting us with much more complex problems than we have yet encountered. It is more to our present purpose to glance at the tribal organization of the Bushman tribes—not as they are to-day, but as they were three centuries ago (28). It is clear that the central and more arid regions of South Africa presented a very similar tribal organization to that which rules in Australia. The unit was the local or family group, wandering over a definite district; the local groups within a certain territory

formed a loosely united tribal community. The Hottentots, occupying the coastal areas of South Africa, were organized in village communities, and the mechanism which maintained the isolation of the South African communities was similar to that we have already studied elsewhere.

This world presents the student of human evolution with two tribal paradises: one is the basin of the Congo, the other is the basin of the Amazon. Sir Clements Markham (29) has enumerated 650 Amazon tribes; I do not know of a complete list of the Congo tribes. Our Belgian colleagues and many Fellows of this Institute—particularly Mr. Emil Torday, Mr. T. A. Joyce and the Rev. John Weeks—are rapidly providing the materials from which an accurate ethnographical map of the Congo region may be constructed. One is impressed by both the points of similarity and the points of diversity that a comparison of the Amazon and Congo tribes elicits. The Amazon tribes one feels to have the less firm hold of life; behind the Congo tribes one feels that there is a vigorous zest to live; there is a robust, irrepressible fecundity. The more I come to know of the population of Africa—the various types and the distribution of these types—the more I am inclined to regard the Congo basin as the probable cradle of the true West African negro.

In order that we may examine the tribal organization of the Congo region rather more closely, I select a certain area, situated in the south-western part of the Belgian Congo, the country of the Bushongo—a triangular area, situated in a fork between two rivers draining into the Congo—a fork formed by the Sankuru on the north and the Kasai in the west. The country of the Bushongo is about 6,000 square miles in extent, nearly the same size as Yorkshire. The Bushongo country was visited by Mr. Emil Torday—accompanied by the late Mr. Norman Hardy—during a justly celebrated exploring expedition made in 1907–1909. A full description of the organization and of the culture of the Bushongo people has been published by Mr. Torday in conjunction with Mr. Joyce (30). Within the Bushongo territory there are 17 sub-tribes, each sub-tribe forming village communities, each community living within a definitely recognized territory. Each sub-tribe speaks its own dialect. Each village community has its head or chief. These sub-tribes are linked together and so form a “kingdom” by an elaborate system of government—a king, a court, a prime minister, an advisory council, and an army chief. Blood revenge between communities of neighbouring sub-tribes has been replaced by a payment in kind. The king is absolute owner of his kingdom—both land and inhabitants. And yet the isolating effects of the tribal organization have not disappeared.

We have now reached the termination of our journey in search of the conditions under which the evolution of new races of mankind have taken place in the past. The question which we have in our minds as we leave the Bushongo is: Why has the tribal barrier perished? When we return to the north-east corner of Scotland, the point from which we set out, the question gradually arises: Why has the tribal barrier disappeared there, and what is the result of its disappearance on evolutionary conditions?

One can conceive that an invader who enters and conquers a tribal territory might break down the tribal barriers and unify village communities into a whole. Mr. Torday's evidence is clearly in favour of the kingdom of the Bushongo having been established by an invading conquering people, but the conquest and many centuries of despotic rule have not broken down the tribal barriers—have not broken up the mechanism that maintains tribes as evolutionary units. I must pass over the evidence relating to the breakdown of the tribal organization in ancient Egypt, in the fertile plains of the Euphrates and Tigris, of the Ganges and the Yang-tse; of the evidence relating to the early days of Athens and of Rome. I have scarcely touched on the tribal organization of the New World, concerning which, thanks to the Ethnological Reports of the Smithsonian Institution, and in later years to the Anthropological Survey now being made by the Government of Canada, our knowledge, so far as it relates to the history and organization of tribes, is more complete and more accurate for the Americas than for any part of the Old World. It is clear that in some parts of America the tribal barriers had broken down in at least one extensive area—Peru. When we sum up the evidence relating to all these centres where large fused non-tribal communities were formed, I think there can be no doubt as to the manner in which tribal organization was destroyed. The destruction of the tribal unit—nature's evolutionary unit—was effected by the overgrowth of a village community. It was the evolution of towns and cities which seemed to have killed it. We can picture fairly clearly the conditions which would turn a village community into a town population. It must be situated on a trade or barter route; it must be the centre of a fertile district and of a prolific people. Given those conditions, with a specialization in labour, tribal organization must break down in a town population, and a new kind of organization—government—take its place.

While making our tribal survey, I have purposely omitted all mention of the class or clan, or totemic system which prevails in all tribal communities. To the student of tribal evolution, the class system in a tribe corresponds to religious sects within a nation. Religion may serve as a bond between the individuals of a nation; quite as frequently it serves, not as a unifying but as a disruptive force. A tribal class-system acts in a similar manner: among Australian tribes it serves to unite the members of a tribe into an organic whole; among Nāga tribes strife is as rife and as virulent between the class-groups of a tribal community as between communities belonging to different tribes. The class-system may act in opposite ways, it may be a unifying or it may be a disruptive force.

In all the dense and expanding populations of the world the tribal organization, under which we must suppose that new races of man were evolved in the past, has completely broken down; the tribe, as an evolutionary unit, is dead. What has taken its place? Are the forces which gave us new races and new types of man in the past now dissipated and destroyed—or has some new evolutionary unit come into being?

An examination of any of the modern states of Europe provides us with an

opportunity of attempting to answer the question I have just asked. There is no state which can serve our present purpose better than the German Empire. Every step in the recent evolutionary history of that empire has been, consciously or unconsciously, to establish the German-speaking people as a single tribe—a single evolutionary unit—and to join their lands into a single tribal territory, circumscribed by an adamant, impassable frontier-line. War has been used to weld the German nationalities into one; war has served to isolate the German-speaking people from all surrounding peoples; it has been employed to effect a “tribal” isolation. A common language, to serve as a tribal bond, was already present; in every instance pains have been taken to make it the common tongue. Religion was recognized by her statesmen as a disruptive rather than as a unifying force. A common education and common military organization were employed as unifying forces. Above all, her statesmen and leaders recognized the incalculable value of impressing a “national spirit,” a “love for the fatherland,” on everyone born within her frontier-line. “National spirit” I believe to be of the same nature as “tribal spirit”—an organized, systematized form of “clannishness”—or, in Professor Giddings’ phrase, “consciousness of kind.” The evolutionary human unit in the past has been the primitive tribe; the world was covered with a mosaic of them; it is clear that in the future the unit is to be a gigantic one—one which will occupy a whole continent. The efficacy of such gigantic units as cradles for new human races—races presenting a distinctive physical type—types which will be as clearly demarcated as the most diverse of modern races—must depend on the duration, the permanency, of their existence. It is certain that, under the new condition, evolution of new types will be retarded, not accelerated. But the appearance of new human types will not be arrested; the same forces are at work as in the distant past.

BIBLIOGRAPHY.

- (1) Ellis, Alex. S.: *English Dialects, their Sounds and Homes*. London, 1890.
- (2) Wagner, Moritz: *The Darwinian Theory and the Law of Migration*. (English Translation, 1873.)
- (3) Romanes, George S.: *Darwin and after Darwin*. London, 1897.
- (4) Galton, Francis: *Narrative of an Explorer in Tropical South Africa*. 1853.
- (5) ” ” *Inquiries into Human Faculty and its Development*, 1883.
- (6) McDougall, William: *Introduction to Social Psychology*. 9th Edition. 1915.
- (7) Giddings, Franklin H.: *The Principles of Sociology*. 1898.
- (8) Du Chaillu, Paul: *Explorations and Adventures*. London, 1861.
- (9) Selenka, Emil: *Menschenaffen Studien über Entwicklung und Schädelbau*. 1898–1900.
- (10) Hose, Charles, and McDougall, William: *The Pagan Tribes of Borneo*. 1912.
- (11) Spencer, Baldwin, and Gillen, F. J.: *The Native Tribes of Central Australia*. 1899.

- (11a) Spencer, Baldwin, and Gillen, F. J.: *The Northern Tribes of Central Australia*. 1904.
- (11b) Spencer, Baldwin: *Native Tribes of the Northern Territory of Australia*. 1914.
- (12) Matthew, Rev. John: *Two Representative Tribes of Queensland*. 1910.
- (13) Brown, A. R.: "Three Tribes of Western Australia" (*Journ. Roy. Anthropol. Inst.*, 1913, vol. 43, p. 143).
- (14) Wheeler, G. C.: *The Tribes and Intertribal Relations in Australia*. 1910.
- (15) Haddon, A. C.: *Reports of the Cambridge Anthropological Expedition to Torres Straits*. See particularly Vol. VI, 1908.
- (16) Seligman, C. G.: *The Melanesians of British New Guinea*. 1910.
- (17) Williamson, R. W.: *The Mafulu Mountain People*. 1912.
- (18) Forbes, H. O.: "The Tribes of Timor" (*Journ. Roy. Anthropol. Inst.*, 1884, vol. 13, p. 402).
- (19) Hodson, T. C.: *The Nāga Tribes of Manipur*. 1911. See also *Journ. Roy. Anthropol. Inst.*, 1901, vol. 31, p. 300.
- (20) Seligman, Dr. and Mrs.: *The Veddas*. 1911.
- (21) Rivers, W. H. R.: *The Todas*. 1906.
- (22) Crooke, Wm.: "The Stability of Caste and Tribal Groups in India" (*Journ. Roy. Anthropol. Inst.*, 1914, vol. 44, p. 270).
- (23) Thurston, Edgar: *Castes and Tribes of Southern India*. 1909.
- (24) Sykes, Sir Mark: "The Kurdish Tribes of the Ottoman Empire" (*Journ. Roy. Anthropol. Inst.*, 1908, vol. 38, p. 451).
- (25) Seligman, C. G.: "Hamitic Problems of the Anglo-Egyptian Soudan" (*Journ. Roy. Anthropol. Inst.*, 1913, vol. 43, p. 593).
- (26) Cummins, Major S. L.: "Sub-Tribes of the Bahr-el-Ghazal Tribes" (*Journ. Roy. Anthropol. Inst.*, 1904, vol. 34, p. 149).
- (27) Johnston, Sir Harry: *The Uganda Protectorate*. 1902.
- (27a) " " "The Ethnography of Africa" (*Journ. Roy. Anthropol. Inst.*, 1913, vol. 43, p. 375).
- (28) Theal, G. McCall: *History and Ethnography of South Africa*. 1907.
- (29) Markham, Sir Clements: "List of Tribes of the Amazon" (*Journ. Roy. Anthropol. Inst.*, 1910, vol. 40, p. 73).
- (30) Torday, E., and Joyce, T. A.: "Les Bushongo" (*Annales du Musée du Congo Belge*. 1911. Tome II, fasc. I).

GEOGRAPHICAL DISTRIBUTION OF ANTHROPOLOGICAL TYPES IN WALES.

[WITH PLATES I-V AND MAPS IN THE TEXT.]

By H. J. FLEURE and T. C. JAMES.

INTRODUCTION.

THE subject has been studied by the great pioneer, Dr. John Beddoe,¹ with results which, so far as they go, are continually being confirmed by subsequent work, while other scientific workers, notably Professor Boyd Dawkins,² have stated their impressions and views at various times. In Scotland Messrs. Gray and Tocher³ have approached the subject from the point of view of pigmentation, while in Ireland Drs. Haddon and Browne⁴ have furnished detailed and accurate descriptions of a fairly limited number of individuals and have pointed the way to the study of individuals rather than of characters in masses of individuals. It is largely owing to the generous encouragement given to us by Dr. Haddon that the present research has been attempted and carried through thus far. One should mention also, in any introduction, the foundations so thoughtfully laid by Prichard,⁵ who in one place discussed skulls and other physical characters and in another summarized the then available philological evidence.

Abroad, extensive studies of a statistical type have been carried out, notable among these being the work of Collignon⁶ in France. The method usually followed has been that of the study of an individual character such as cephalic index or stature or brunetness in very large numbers of people, supplemented by less formal references to the occurrence of various cephalic indices with varying types of pigmentation and varying statures. It has been the character more often than the individual which has focussed the main attention of the workers, and this has led to the treatment of observations by the obvious method of district averages which are expected to bring out the dominant type and range of variation. Sergi⁷ has made

¹ Beddoe, J., *Races of Britain*, 1885.

² Dawkins, W. Boyd, *Journ. Roy. Anthropol. Inst.*, 1910, p. 233, and *Arch. Camb.*, 1912, p. 61; also *Early Man in Britain*, 1880; *Cave Hunting*, 1874.

³ Gray, J., and Tocher, J., *Journ. Roy. Anthropol. Inst.*, 1900, p. 104.

⁴ Haddon, A. C., and Browne, C. R., *Proc. Roy. Irish Academy*, series 3, vol. ii, several articles.

⁵ Prichard, J. C., *Researches into the Physical History of Mankind*, 5 vols., 1841.

⁶ Collignon, R., *Bull. Soc. Anthr.*, Paris, 1883, p. 463, 1890, p. 736, and *Mem. Soc. Anthr.*, 1894, No. 1, and 1895, No. 6, etc.

⁷ Sergi, G., *The Mediterranean Race*, 1901.

special efforts to advance beyond statistics and to study form. Older than this method of approach to the race problem is that of the examination of ancient skulls found in interments, the relative ages of which are judged by their positions and accompaniments. The classical studies under this head for Western Europe may be said to be *Crania Britannica*,¹ *British Barrows*,² *Reliquiae Aquitanicae*,³ *Anthropologica Suecica*⁴ and *Crania Ethnica*.⁵ It has been the natural endeavour of the two groups of workers to correlate one another's conclusions with their own. The archaeologist, however, usually gives detailed, but necessarily incomplete, information about a small number of individuals; thus our description of the Palæolithic stocks in Europe is in reality based on observation of quite a small number of individuals, and it needs some faith in anticipation of future discoveries to accept often less than a dozen individuals of some type as determining for us a race of former inhabitants in Europe. That faith has been to some extent justified as confirmatory evidence has accumulated, but the conclusions need to be stated with reserve for some time. There is, however, the important point that the archaeologist has tended to define his type as an individual, while the anthropologist has defined an agglomeration of characters without sufficient observation of the extent to which they occur together. A population in a given district may have a low average cephalic index and a low average stature, and the tendency is to describe a type with these two characters as a feature of the district. The conclusion is correct as far as it goes, but it is probably misleading in that it will ignore, let us say, a number of very narrow-headed people with a stature above the average, or, perhaps, a distinct sprinkling of brachycephalic types. In spite of these limitations it is, however, frequently attempted to correlate ancient and modern types and their distributions, and this is done with some success. The correlation is made with difficulty even by Ripley,⁶ who accepts the view that such characters as cephalic index are inherited in a fairly pure fashion. Relying upon published averages, Ripley emphasizes a supposed marked uniformity of head form in the British Isles, though he limits this sweeping statement shortly afterwards by adding that this is in so far as it is judged by the cephalic index. In consultation with Dr. Beddoe he has, however, identified representatives of ancient brachycephalic immigrants, but, apparently in obedience to published averages, he refers to broad-headed types as being almost extinct in the British population. It would thus seem to him that investigation of physical type or at least cephalic type in Britain is an almost hopeless method of studying race-history. Miss Semple,⁷ as a student of environment, utilizing Ripley's statements without his anthropological experience, refers to the uniformity of cranial type prevailing all over the British

¹ Davis, J. B., and Thurnam, J., *Crania Britannica*, 1865.

² Greenwell, W., and Rolleston, G., *British Barrows*, 1877.

³ Lartet, E., and Christy, H., *Reliquiae Aquitanicae*, 1875.

⁴ Retzius, G., and Fürst, C., *Anthropologica Suecica*, 1902.

⁵ De Quatrefages, A., and Hamy, *Crania Ethnica*, 1882.

⁶ Ripley, W. Z., *Races of Europe*, 1899.

⁷ Semple, E. C., *Influence of Geographic Environment*, 1911, p. 421.

Isles, saying that the cephalic indices range chiefly between 77-79, a restricted variation as compared with the points which represent the usual range for Central Europe, and so on. The implication in Miss Semple's book is given by the heading of the paragraph, which is: "Unification of Race in Islands." Ethnic intercrossing is given as a characteristic of island peoples; intimate contact among themselves in their compressed isolation is said to force an amalgamation of race culture and speech.

Boas,¹ after immense statistical study of immigrants into America, relying upon averages of individual characters for the most part, accepts that method as inevitable, but hints strongly that conclusions reached through it throw doubt upon the pure and persistent inheritance of such characters as cephalic form. "It would be saying too much to claim that all the distinct European types become the same in America, without mixture, solely by the action of the new environment. First of all we have investigated only the effect of one environment, and we have every reason to believe that a number of distinct types are developing in America Although the long-headed Sicilian becomes more round-headed in New York, and the round-headed Bohemian and Hebrew more longheaded, the approach to a uniform general type cannot be established because we do not yet know how long the changes continue and whether they would all lead to the same result. I confess I do not consider such a result as likely, because the proof of the plasticity of types does not imply that the plasticity is unlimited. The history of the British types in America, of the Dutch in the East Indies, and of the Spaniards in South America favours the assumption of a strictly limited plasticity." The underlying view here is that the type is plastic to a fairly large extent and that, through the influence of environment, a mixed population in virtue of this plasticity tends in some degree toward uniformity.

Such views if established would destroy the foundations of anthropological research for the elucidation of race history, and it becomes important to look into the question. We then find that the characters of Sicilian and Bohemian and Hebrew are average characters, and insufficient attention has been given to the fact that the range of individual variation within each of these groups may be very considerable and that in some instances an average is almost meaningless. The emphasis laid for so many years upon average values has nevertheless led to this fact being largely overlooked, and grave doubt is in consequence being thrown upon the value of physical anthropology for the purposes of race history.

Widespread attention has been given for social reasons in recent years to measurements of British children, and it is characteristic of the disrepute into which race study had sunk, or of the widespread acceptance of the notion of physical uniformity of the British type, that in several reports on these physical examinations little or no attempt is made to distinguish between the different race types. Children are compared very frequently with an "average child" and

¹ Boas, F., *Changes in Bodily Form of Descendants of Immigrants*, New York, 1912.

conclusions are reached showing that some district-average, already somewhat meaningless owing to mixture of type, is below what is supposed to be the general average. It is possible in some such cases that there may be a preponderance or at any rate an abundance of some type for which the measurements in question are normally small; but the tendency of the observer is more frequently to attribute the smallness to bad housing, imperfect nutrition, and so on. These factors are no doubt responsible for a great deal, sometimes in the direction of stunting and retardation, but no doubt also act differentially.

The importance of differential elimination as a factor affecting Boas' results is possibly great, and its powerful action through emigration as well as through death-rate in Britain recently is almost certain. We can also hardly be said to know anything as yet about the ontogeny of racial types: it is essential for us first of all to know what are our racial types, and the determination of these is still inadequate. Perhaps the present schemes of reports on school children are the best possible under existing conditions of ignorance, but the consequent limitation of their value should be borne in mind more generally than is the case at present.

As regards differential elimination, the potency of this factor has been recognized by students of the race history of the Eastern Mediterranean, and Von Luschan¹ gives a tragic instance of the migration of one thousand Circassian families into Western Asia near Islahiyeh in 1880, after the fall of Shamyl. In 1910 about seven families in a wretched state of fever and disease were all that remained. A study of cephalic indices and other physical characters near Islahiyeh in 1880 and in 1915 would probably have revealed striking differences due in this case undoubtedly to differential elimination. It must remain an open question for the present whether homologous factors may not have operated in the United States, leading either to the elimination, probably in infancy, of certain descendants of immigrants who might have survived in their original homes, or to the survival of certain of those descendants who might have been eliminated, also probably in infancy, in their original homes.

At all events it seems that even a conservative statement on Boas' lines is considerably more than the evidence justifies, based as it is on averages of such complex mixtures as those which come under the heading of "Sicilians," "Bohemians," "Hebrews," and so on. We may thus, for the present, retain some confidence that such physical characters as cephalic form have some degree of permanency, and it is hoped that this paper may help to strengthen that view by giving grounds for a belief that certain types, without any intervening social or linguistic barrier for centuries, have apparently persisted side by side in very marked fashion in certain parts of Wales.

The notion of a fair degree of permanence of physical characters has already received some support from studies of heredity on modern lines. Hurst² has

¹ Von Luschan, F., *Journ. Roy. Anthropol. Inst.*, 1911, p. 221.

² Hurst, C. C., "Inheritance of Eye Colour in Man," *Proc. Roy. Soc.*, B, 1908, p. 85.

brought forward reasonable evidence in favour of the view that eye colour is inherited according to the Mendelian fashion. Dr. Brownlee¹ has worked out mathematical analyses of some of Dr. Beddoe's tables and has given some evidence for the view that the distinctions, especially in pigmentation, which Dr. Beddoe drew, represent real differences, and that the distributions of these characters among country folk in a settled district, without bars to intermarriage such as differences of religion or speech, conforms very closely to that which would be the case if inheritance were according to the Mendelian formula. Mathematical analysis is so dependent upon the premises whence one starts that it would be unwise to emphasize this type of evidence, but it at least does tend in some measure towards strengthening Mr. Hurst's view. It may be said that certain component features of head form in many cases seem to segregate more or less in Mendelian fashion, but this is matter for a further investigation; we are on safer ground in saying that the children of parents of different head form very frequently show a fairly complete resemblance to one or other parent, *i.e.*, that head form is frequently inherited in a fairly pure fashion.

It will be seen from the foregoing that we have aimed at avoiding the dangers attending the averaging of quantities or characteristics which are not homologous, but that, in this effort, we have come into contact with the most difficult problem in race-analyses, namely that of strictly characterizing the various types. They have often been defined primarily as regards cephalic index and pigmentation, and these and other characters are to some extent linked. This linkage is a subject for considerable investigation, but it is *a priori* unlikely that all the characters of an individual are so linked that it is possible for a man to be of "pure breed" throughout. Moreover the various breeds, be they never so clearly and completely defined, are undoubtedly differentiations from a not-so-very-remote common ancestral stock; they may not be more than sub-varieties in the biological sense. The presumption is thus that intermediate types may be either the result of intermixture or the consequence of a still uncompleted differentiation from a common ancestry. Considering, therefore, the grave inherent difficulties of the subject, it is our wish to put conclusions forward very tentatively and to state very frankly that methods of anthropological research must long be based upon the principle of choosing the lesser evil.

The dangers of the study of averages for selected districts have been set forth in such a way as to show the small value of averages unless we are sure of the, for our purposes, close homology of the matters averaged—and, in deciding race-characters, that homology must be close indeed, as we are dealing with what, at their highest, are barely varietal differences.

Another danger is, however, quite as great. The district selected may include several non-homologous parts, that is parts which have populations of different type and origin and homologies here change continuously with the changing

¹ Brownlee, J., *Journ. Roy. Anthropol. Inst.*, 1911, p. 179.

circumstances of changing periods. Thus two villages which seem strictly comparable now may have been widely distinct in times past: one may have been a station on a pilgrim-way and the other an isolated hamlet of agriculturists; one may have been habitable before the forests were cleared, the other not.

It has frequently happened that county averages have been given, and reflection will show how multiple the types and minglings of environment within such an area may be. Cardiganshire includes a high moorland, once perhaps occupied by forest, a lower moorland kept partially clear of trees by the westerly breezes, shepherds' hamlets, agricultural villages, market towns and finally seaside resorts. The upper moorlands are remote from railways and even from reasonable roads, the lower moorlands are full of the remains and the memories of prehistoric time, the seaside resorts hide a small mediæval nucleus in the centre of a boarding-house system, which has but the most casual relation to the rural population. A general statement about such a county is therefore weakened, as the diversity of types massed together will doubtless not permit the adequate expression of the distinguishing features of the real constituent elements. And yet a quiet rural county like Cardiganshire is probably unusually homogeneous, so the difficulties elsewhere will often be greater. In attempting to find a better way, however, we are faced with the same obstacles as before. We have grave difficulty in making reasonably sure of distinctive types of environment and it may be difficult even after careful geographical and archæological study to be assured of the homology of environments.

On every ground, therefore, we have reason to deal with individuals as far as possible, and to use averages only very restrainedly and for very carefully considered areas and groups.

In our work we have had in mind the criticisms urged by Flinders Petrie¹ and by Ridgeway² against physical anthropology. Both believe that type varies with environment and circumstance, and it would be interesting to go over the whole discussion point by point were it sufficiently profitable. It seems, however, that Flinders Petrie has in mind the method of averages as it has usually been employed, and with strictures upon the value of its conclusions we must confess to some sympathy. At the same time we should not venture to lay so much stress on the importance of migrations in substituting one population for another as Petrie seems inclined to do. Indeed, our work, so far as it goes, seems to indicate a remarkable persistence of type, a persistence so definite that, without the modern Mendelian hypotheses about heredity, there would be difficulty in accepting it as a fact. Ridgeway's views do not help one to understand such populations as our Welsh ones, where a rural district may have been exporting, and not importing, men for centuries and may yet show very marked diversities of type in a mixed population for explaining which no effective differences of environment can be postulated.

¹ Flinders Petrie, W. M., "Migrations," Huxley Lecture, 1906, *Journ. Roy. Anthropol. Inst.*, vol. xxxvi, 1906, p. 189.

² Ridgeway, W., "The Application of Zoological Laws to Man," *Report British Association* (Section H), 1908, p. 832.

THE GENESIS OF THE RESEARCH.

It is a matter of common remark among Welshmen that one can "tell" a man from such and such a district anywhere, and such remarks are true in a greater degree in Wales than in most parts of England, for it is certainly possible to do a great deal of identification without having recourse to distinctions of voice, intonation or speech. We have repeatedly identified people at sight as coming from Newcastle Emlyn, Llandyssul, Tregaron, the coal valleys of Glamorgan, the great cleft of Merionethshire and so on. There is therefore little doubt that something like "local types" still survive in Wales, though it must not be expected that all, even of the old residents, will approach that type in any case. Further, these local types are very markedly contrasted one with another, and, as will be shown in the sequel, approximate to various race types identified by anthropologists for Europe and traced by archaeologists in ancient interments. There is thus a presumption that in Wales, as a country comparatively little affected by modern movements of people save in certain well-marked districts, we find persisting in various parts types of mankind whose distinctions are not transient and accidental but rather date from a very remote past, and should be of use in elucidating the history of settlement. Incidentally it may be remarked that if such distinct types persist, often side by side, in Wales, and if they have persisted in some cases for hundreds of years or even longer periods, we have a case which is, to say the least, in most marked contrast with that of the immigrants into the United States of America as stated by Boas.¹ There can be little doubt that, even in Wales, local distinctions are weakening fast under the unifying influence of the railways and the levelling efforts of the Board of Education, and anthropological research in the country thus represents an attempt to secure vanishing data. Under the circumstances an effort has been made to assure the retention of the data as well as the results. The facts collected for each individual are registered together on a card which offers a permanent record of many details, in the hope that they may be available for re-analysis,² if that should be deemed desirable in the future.

It was decided to measure anyone and everyone who was of purely Welsh descent so far as known, to concentrate upon the simpler folk, as the more leisured classes are nearly everywhere of very mixed descent, and especially to avoid any tendency to select individuals for any reason whatsoever.

Perhaps there was at first some inclination to accept as inevitable the common doctrine of westward waves of migration of peoples each more or less displacing previous ones, but as it became evident that such a hypothesis was not in any kind of relation to the results attained, save in a very broad fashion and to a very slight extent, it was soon given up, and some years were spent in the collection and

¹ Boas, F., *Changes in Bodily Form of Descendants of Immigrants*, New York, 1912.

² We hope to be able to place copies of all our cards both in the National Library of Wales at Aberystwyth and in the collections at the Royal Anthropological Institute in due course.

analysis of data before any theory of distribution was found. We, therefore, feel safe from the danger of being among those who find what they set out to find. A hypothesis,¹ which opened up possibilities of reasonable interpretation that have grown in several directions, was developed only after five years of work, and arose out of an endeavour to reconstruct primitive conditions in a neighbourhood, with a view to appreciating some archæological peculiarities noticed in geographical study. The fact is that this clue and another were found not because they were imagined and then looked for, but because every possible related line of inquiry was pursued in the hope of obtaining new light.

THE OBSERVATIONS TAKEN AND OTHER DETAILS OF METHOD.

The Committee of the British Association on anthropometric investigation in the British Isles issued its final report in 1908, when our work had already been organized for some time, but we had the advantage of consulting Dr. A. C. Haddon before beginning the work in 1905, and we were thus able to work to a considerable extent on lines suggested in that report. Our debt to Dr. Haddon for advice and encouragement is a very deep one, but we must claim full responsibility for any errors or shortcomings in method and in the selection of observations to be taken.

The Committee's scheme is a very exhaustive one, and is, of course, not by any means adapted to be carried out on the large number of individuals which must be studied for purposes of research into race history. We have, therefore, gradually selected a number of points as follows for adults:—

Name and address.

Sex and age.

Details of location and, if possible, family history of grandparents.

{ Mother's side. }
{ Father's side. }

The family history is a matter of proud tradition in rural Wales, and we were thus able to gain useful information which helped us to avoid putting recent immigrants or chance inhabitants among the supposed settled and old-established population of any given neighbourhood. Communications have improved only so very recently in rural Wales that in very many cases we found that the four grandparents of a villager belonged to a district of a few miles radius; dialect barriers and other factors have no doubt contributed to this result. We have thus not come too late to find traces at least of old-established and almost untouched populations, and we have ground for expectation that the distributions noted may be of quite long standing. The individuals described for a locality will be likely to be, as it were, concentrated essences of that locality. As there has been no movement of immigration on a large scale, save on the coalfield, for a long time, a

¹ Fleure, H. J., "Welsh Archæology and Anthropology," *Arch. Camb.*, 1913, p. 153.

type found to be characteristic of a district is likely to be an old-established fact, especially if anthropological analyses and local opinion agree, as they often do. When it is found possible to correlate these types with ancient types described from skeletons the presumption of a long-continued persistence of a type is greatly strengthened.

Next to the above facts are noted some general characters for the observer's guidance :—

Skin, to be described as pale, sallow, dark, fresh, florid, with note on freckling.

Eye, described according to Professor Martin's "Augenfarbentafeln." Care is taken to discriminate between blues and greys, and to separate dark blue from the browns. Mr. C. C. Hurst's¹ observations of eyes have been prominently before us for some years.

Hair quantity, scarce, medium, abundant.

Hair colour, black, dark brown, medium brown, light brown, fair, auburn, fair red, dark red.

Face shape, long oval, broad oval, squarish, wedge-shaped. Notes on smoothness or fineness of feature.

Shape of nose, numbered from a chart specially drawn out.

Lips, thin, medium, thick.

Ear, size and form, whether lobule present, and if so whether laterally attached or not.

Head contour.

We have found such characters as dark skin, glossy black hair, prominent arched nose and so on of great interest in the course of the work.

The following measurements are taken, all in millimetres :—

Head length, maximum glabellar-occipital length.

Head breadth (maximum).

Bizygomatic breadth (maximum between corresponding points on opposite zygomatic arches).

Bigonal breadth (maximum between corresponding points on posterior angles of lower jaws).

Auriculo-nasal radius (to nasion).

Auriculo-alveolar radius.

Maximum head circumference.

Standing height.

Length of arm, from point of shoulder to tip of middle finger.

Length of leg, from top of upper edge of great trochanter.

This is a selection found by experience to give data useful for discrimination among the types in the district studied, and though it has not been found possible

¹ Hurst, C. C., *op. cit.*

to cut out any of the above it should be stated as a guide to other workers that the list is too long for use in a really extended survey. It is difficult to get people to consent to the taking of so many details and, in our case, the effort has been extended to approximately 2,500 individuals. The card records the observer's initial, date of observation, the place of observation, and any details of the family history of pigmentation the subject may be able to give.

It has been our custom for one of us to take the family history and descriptive points while the other took the head measurements, a helper sometimes taking the stature and limb measurements. In two districts considerable help was received from friends, Mr. Ll. T. Jones, B.Sc. (at Tregaron), and Mr. John Thomas, B.Sc. (at Harlech), but the measurements they took after getting experience with us, are registered in their names. Our friend, Mr. J. H. Shaxby, also gave us considerable help.

The work was done frequently under difficult conditions, and it was specially necessary to avoid unnecessarily complex instruments. We have therefore designed and used callipers provided with rods which could slide, and the instrument was thus used to take the radial measurements as well as the others. There can be no doubt about the importance of these radial measurements, and it is one of our chief regrets that we had to limit ourselves to two. *Notes and Queries on Anthropology*¹ refers, not without reason, to the difficulty of getting these measurements satisfactorily done.

Space is left on the card for cephalic index, but no statement as to "race type" or any other inferential matter was allowed, as it was a fundamental principle to try to avoid such forms of argument in a circle as would have been involved, had cards labelled in that way been utilized for study in race analyses and race character. Particular stress is laid upon the facts that by our method a person's characteristics were all permanently recorded on one and the same card, thus enabling us to analyse and re-analyse individuals as well as characters. Also, having the family history in some degree, we were able to place a card in the district to which it belonged by descent rather than by possibly temporary sojourn. Of course the value of this precaution is not so great as it might be if family history were better known, but it is probably permissible to suppose that there was less movement of population and less interregional mixture in rural Wales two generations ago than there has been since railways and education became important factors. Our endeavour was to measure all adults not too old to show the characters without decadence. No selection was attempted, save that persons with known foreign blood were avoided, unless it happened to be a case of people in the counties of England bordering Wales, and then the fact was specially registered. Cases of obvious deficiency or deformity were of course avoided or discarded. The difficulty of getting accurate measurements of women under our conditions of work has led to the number of women measured being somewhat small, but probably less

¹ *Notes and Queries on Anthropology*, fourth edition, 1912, p. 9.

is known of racial type amongst women and it is hoped to study this question independently later. The arguments in the present paper are from measurements of men between about 19 and 65 years of age, save where the contrary is stated.

The above inquiries as to family history are, we think, a fairly new point in anthropological work on this scale; most previous workers seem to have been satisfied to take residents, and in some cases little was done to avoid getting chance visitors included. This raises the question of the numbers necessary for justifiable conclusions, and we have to point out here that Dr. Beddoe's¹ series for South Wales included 66 individuals, though he says that this permits but scanty inferences. Indeed, he says little more than that the average cephalic index is 78. From more detailed observation of 16 cases he infers with less certainty a broad forehead, a small glabella, a somewhat low head, a somewhat short face, and a considerable lateral development of the zygoma. The total number measured for South England (including Gloucestershire) by Dr. Beddoe was just under 550, together with a few classed as educated Englishmen without statement of their place of origin or residence. The numbers for the other districts touched were mostly quite small. It is thus seen that the facts of this principal authority rest on what seems a slender basis, but it should be remembered that, in Dr. Beddoe's case, the measurements were largely a supplement to an acute general observation of physical type, strangely accompanied, as his remarks frequently show, by misapprehension in matters of psychical inference.

Analysis of Observations.

It is in reference to the analysis of observations that our methods have become most differentiated. At first, curves of cephalic indices and so forth were plotted in the accepted fashion, but it was found that our population was too mixed for this to have much real value. Sometimes the number of the long-headed people in a district was sufficient to give that curve a very distinct form, but, frequently, there were fair dolichocephals as well as dark ones, and a curve of cephalic indices became confused unless it were constructed for either fairs or darks as the case might be. If, however, that were done, then the problem was to decide the limits of fairness or darkness, and the form of the curve depended on the limits chosen.

Thus there was grave risk of argument in a circle, the besetting danger of anthropometrical research. The danger was increased by the fact that our method of analysis at that time necessitated choice of boundaries for the districts taken; this proved difficult and dangerous, since the determination of limits of areas possessing characteristic types was one chief point at issue.

Gradually, therefore, in order to avoid these dangers a plan was evolved of mapping people, individual by individual, on a large scale map. The individuals were designated by letters selected according to the accompanying table, so that

¹ Beddoe, J., *Races of Britain*, 1885, p. 231.

one composite mark described several important characters of the individual mapped. (Figs. 1 and 2 and Table 1, p. 51.)

L would thus represent a tall, roman nosed, fair haired, blue eyed adult man of cephalic index between 81 and 82.

{b would represent a short, black haired, brown eyed, prognathous person of cephalic index between 73 and 74.

The number of permutations and combinations of which this type of registration is capable makes it very useful for dealing with very finely graded forms such as are human individuals in a civilized country. The individual was registered on a map only if all four grandparents came from one sufficiently restricted area, say a radius of 12 to 15 miles about some spot, and thus the numbers put on the maps were not very large, but each mark on the map meant a good deal. Of course it is difficult to choose exactly the right spot for entering the register on the map in many cases, and the registration marks must therefore be interpreted in a broad sense as far as distribution is concerned.

It will be noticed that this method has several advantages:—

- (1) It permits us to study the distribution of any one physical character, *e.g.*, "Roman" noses, black hair, and so on.
- (2) It permits us to study the correlation of the selected character with others registered.
- (3) It retains the grouping of characters in each individual and permits us to study individuals.
- (4) It in no way prejudices questions of type as would be the case if the individuals were simply registered according to "types" inferred from our work or from accepted anthropological theory.
- (5) If the maps are considered broadly there is likewise no prejudgment of the distribution question, but care must be exercised to avoid narrow interpretations and sharp delimitations in this connection.

Our map registers, constructed as above, have enabled us to verify facts of occurrence of local types and, from the study of the map, it has been possible to turn back to the card corresponding to each registration mark in a district, and thus to compare afresh in all details taken the various individuals studied in a district, with a view to sorting out the various strains as far as possible. In no case has there been selection of individuals on any grounds save those mentioned here, *viz.*:—

- (a) Of ascertained parentage and ancestry as far as possible.
- (b) Of mental health and of freedom from deformity.
- (c) Of approach to maturity and absence of senility.

Our "local types" are studied especially in relation to more or less natural regions so far as the life of the people is concerned. We have tried to avoid grouping together, for example, hill shepherds and fisher folk, as would have been likely had we accepted administrative units. The recognition of these smaller

natural districts or regions has involved prolonged and intensive geographical study, and we have applied this mainly to the counties of Cardigan and Merioneth, but our studies have extended to other counties, as will appear in the sequel.

In these two counties we are able to study moorlands, deep valleys between hill ridges, coastal fringes, long lines of through-communication, and many other natural divisions of the country, and these two counties are in a very special sense the most Welsh of all, so that we may expect to find less admixture of English influence and types here. Carnarvonshire, in virtue of the relations of its two chief towns and also of the existence of the great through-routes between the mountains, does not seem to us to show the same apartness from English and other influences of comparatively recent date.

We have disregarded the political boundaries of the counties in order to discuss districts which are vital units. Thus the boundary between Cardiganshire and its southern neighbours for a considerable distance is the River Teifi, on which stand the little market towns of Llandyssul and Newcastle Emlyn, as well as smaller villages. The boundary is doubtless a reminiscence of the days when the valleys were almost uninhabited because they were filled with woodland and man was living on the moorlands above. This will have to be discussed at a later stage, but it is pointed out here as showing that lines of separation at one period may be lines of intercourse at another, and that it is obviously necessary to avoid artificialities in assigning limits. Our limits, thanks to the map registration method, can be revised at any time if newer knowledge makes this desirable, and this facility of revision, we claim, is characteristic of all our work. We feel that permanent record of actual facts for each individual, and treatment with a view to future revision at every stage, is the only way in which work such as ours, on vanishing data very difficult to collect and still more difficult to classify, can be workably organized.

It expresses, further, the tentativeness of all our conclusions and our frank and unreserved admission of the difficulties of a satisfactory identification of types.

Our tables are to be looked upon as extracts from our cards, and the same individual may appear on more than one district-table if he belongs to some place which it is difficult to allocate to one district or another definitely.

After ten years of work it has become possible to describe a man broadly at sight and without his being aware of it. It has therefore been proposed to supplement the present study of types by a much more extended survey of distributions, to go everywhere and fill up observation cards of all the men and all the women seen in each village or hamlet. Cards for this purpose include about eighteen columns representing various combinations of cephalic index and pigmentations. Each individual is registered as S., M. or T. according to whether the stature is short, medium or tall. With this scheme it will not be possible to ascertain a man's ancestry, but the visiting of the villages at times when strangers are not likely to be about, coupled with the fact of the large numbers taken, is a compensation. Our older method of accurate measurement does not lend itself to distributional study in detail save with measurements carried out universally by a

large staff of paid and trained workers. The new method has already proved its value, and its results, checked by measurements where necessary and possible, will be the subject of a further paper. The present paper is an effort to ascertain types and certain of the broader facts of their distributions, supplementing this by inquiries into geographical, historical and archæological correlations which help to give meaning to the distributions noted.

It will be convenient to have at the outset a general table showing cephalic index and pigmentation (Table 2, p. 52) of adult men measured, and a similar table of women (Table 3, p. 53). We do not propose to discuss these general tables in detail, but think them useful for showing frequencies of such characters as red hair, black hair, long heads, etc., thus enabling us to judge by comparison whether any of these is specially noteworthy in a district studied in detail. The tables deal with 1852 men and 344 women.

It will be noticed firstly that the women seem broader-headed than the men, as is best seen by placing side by side the percentages of men and of women having cephalic indices of certain values.

	Percentages.	
	Men.	Women.
Under 73	<u>2·7</u>	1·4
73 to 73·9	<u>3·2</u>	1·7
74 to 74·9	<u>7·3</u>	2·6
75 to 75·9	<u>11·2</u>	7·3
76 to 76·9	<u>12·3</u>	11·6
77 to 77·9	<u>13·2</u>	11·9
78 to 78·9	<u>12·7</u>	10·5
79 to 79·9	<u>13·2</u>	9·0
80 to 80·9	9·8	<u>13·1</u>
81 to 81·9	5·9	<u>11·6</u>
82 to 82·9	3·8	<u>7·3</u>
83 to 83·9	2·7	<u>5·2</u>
84 and over	1·9	<u>6·7</u>
Total number of cases	1852	344

These figures are rather striking and the excesses show such a regular gradation that the differences cannot be due to irregularities arising from small numbers. The larger percentage in each case is underlined, and the underlining is double if the ratio is greater than 3:2. It will be seen that the excess of men with indices under 76 is considerable (24·45 per cent. against 13·08 per cent.), while that of women with indices above 80·9 is equally striking (30·81 per cent. against 14·36 per cent.). This we do not ascribe in the main to any difference of racial elements on a large scale between the two sexes. If there were a difference, it would be fair to suppose that it had arisen through the intermarriage of newcomers with aboriginal women, though one could not claim that this would lead the present population to show an older type in its women. A slightly more marked inheritance of fundamental type in women is a more or less accepted biological inference, and it is unquestioned that the fundamental type in Britain is the narrow-headed one (in the male at all events). We therefore incline rather to the view that the difference, especially in view of its regular gradation, is principally a sex-difference. It is of great importance to bear this difference in mind in observation work.

The pigmentation differences between the two sexes should also be noted:—

	Percentages.	
	Men.	Women.
Hair light, eye brown	3·5	2·6
Hair red, any eye	7·1	5·3
Hair light, eye light (including all blues) ...	20·5	20·9
Hair dark, eye light	28·8	26·7
Hair dark (including black), eye dark ...	40·1	44·5

We notice here chiefly that among women, dark eyes and dark hair are more often associated together than is the case among men, *i.e.*, there is a tendency to a more marked inheritance of pigmentation, or a more complete inheritance of it, perhaps, among women. We have since found that Beddoe¹ noticed this.

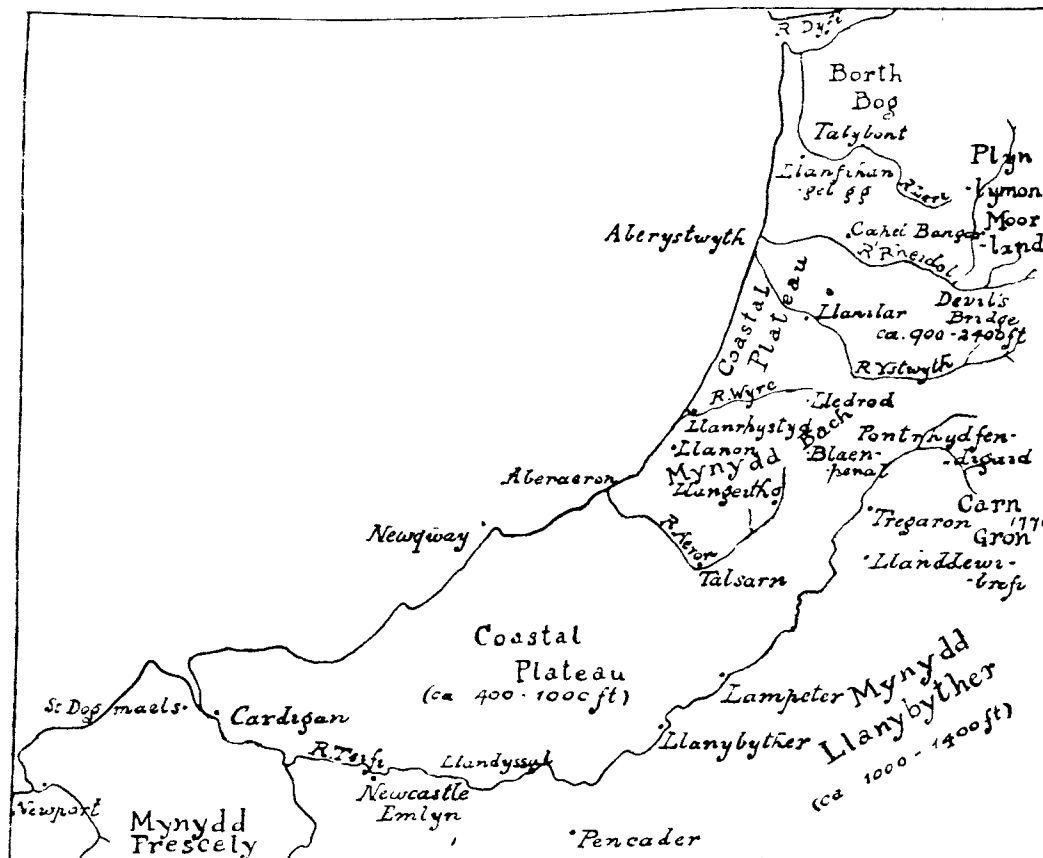
The proportion of men who have dark hair and dark brown eyes and head index over 80·9 is about 14·5 per cent. of all the dark men, while the corresponding percentage among women is 34 almost exactly.

The proportion of men who have dark hair and dark brown eyes and head index over 80·9 is about 40·6 per cent. of all the men with head index over 80·9,

¹ Beddoe, J., *Anthropological History of Europe*, 1912 ed., p. 98.

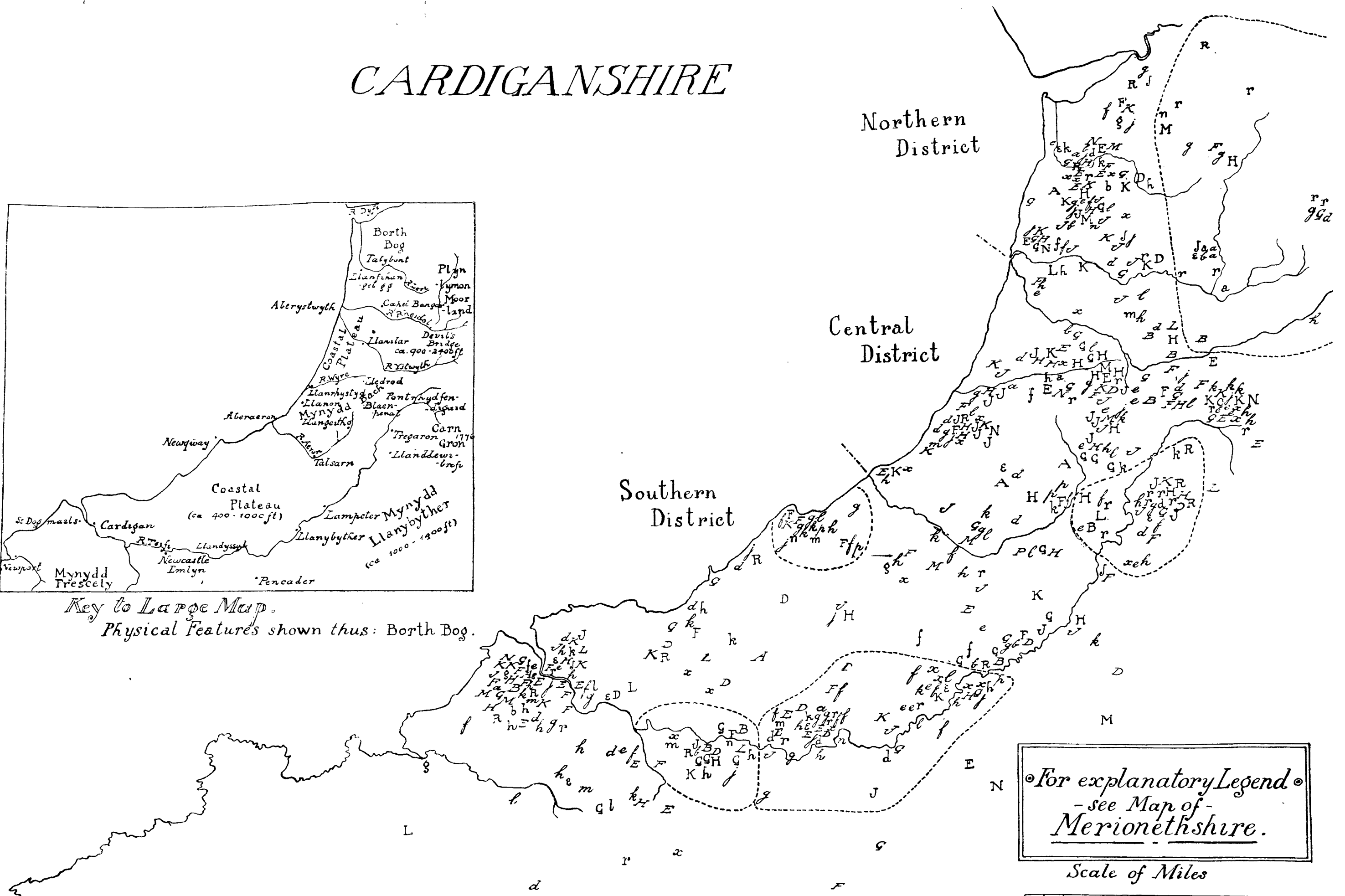
and the proportion of men who have dark hair and eyes is about 40·1 per cent. of the total, *i.e.*, the broad-headed men do not incline to dark colouring appreciably more, or less, than those with longer head. In the case of the women the first percentage is 49·1, the second 44·5. This means that pigmentation is somewhat more marked among the broader-headed women. So far as could be ascertained, the contrasts in measurements between the two sexes were not due to any extent to differences as regards the places where large numbers of men and of women, respectively, were measured. The conclusion is thus almost inevitable that there is an important sex-difference in the colour and head-form in the Welsh population, and with this note we leave the subject for a future discussion in more detail.

CARDIGANSHIRE



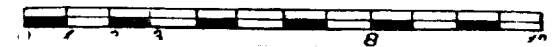
Key to Large Map.

Physical Features shown thus: Borth Bog.



• For explanatory Legend •
- see Map of -
Merionethshire.

Scale of Miles



RE

Moel Hebog.

Scheme of letters used in registering individuals on this Map.
Only those are registered whose ancestry is entirely within a small district, so far as it is known.

Colouring	Cephalic Index	Cephalic Index												
		73	74	75	76	77	78	79	80	81	82	83	84 and over	
Hair fair or light brown Eye light.		A	B	D	E	F	G	H	J	K	L	M	N	P
Hair dark Eye light		A	B	D	E	F	G	H	J	K	L	M	N	P
Hair dark (but not black) Eye brown-flecked or dark.		a	b	d	e	f	g	h	j	k	l	m	n	p
Hair black Eye dark		a	b	d	e	f	g	h	j	k	l	m	n	p

x = Light hair and dark eyes, any cephalic index
r = Reddish hair cephalic index below 79
R = " " " " 79 or above
3 before a letter denotes height under 1675 cms
3 after d " " over 1750 "
~ under d " " "Roman" nose

Scale of Miles

0 1 2 3 4 5 6 7 8 9 10

Only those are registered whose ancestry is entirely within a small district, so far as it is known.

Colouring	Cephalic Index												
	73	73	74	75	76	77	78	79	80	81	82	83	
<i>Hair fair or light brown Eye light.</i>	A	B	D	E	F	G	H	J	K	L	M	N	
<i>Hair dark Eye light</i>	A	B	D	E	F	G	H	J	K	L	M	N	
<i>Hair dark (but not black) Eye brown-flecked or dark.</i>	a	b	d	e	f	g	h	j	k	l	m	n	
<i>Hair black Eye dark</i>	a	b	d	e	f	g	h	j	k	l	m	n	

x = Light hair and dark eyes, any cephalic index
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R = " " " 79 or above
 { before a letter denotes height under 1675 cms
 { after d° " " over 1750 "
 ~ under d° " " "Roman" nose

Scale of Miles



Key to Large Map.

Mountains shown thus: Moel Hebog.

TABLE 1.—SCHEME OF LETTERS USED IN REGISTERING INDIVIDUALS ON THE MAPS HEREWITH.

NOTE.—The numbers used to denote Eye Colour are those of Professor Martin's Augenfarbentafeln.

PIGMENTATION.	CERPHALIC INDEX. ¹												
	Under 73	73	74	75	76	77	78	79	80	81	82	83	84 and over.
Hair light, eye dark (darker than 10) ...	x	z	x	x	x	x	x	x	x	x	x	x	x
Hair red	r	r	r	r	r	r	r	R	R	R	R	R	R
Hair fair or light brown, eye light ...	A	B	D	E	F	G	H	J	K	L	M	N	P
Hair dark, eye light (lighter than 10) ...	A	B	D	E	F	G	H	J	K	L	M	N	P
Hair dark (but not black), eye dark (10 or darker) ...	a	b	d	e	f	g	h	j	k	l	m	n	p
Hair black, eye dark	a	b	d	e	f	g	h	j	k	l	m	n	p

¹ We used the Glabello-Maximal Length, and this should be borne in mind in connection with any comparison between our figures and those obtained when the Ophryo-Maximal Length is used. Probably one might allow a difference of rather less than one unit in the cephalic index, the figures if the Ophryo-Maximal is used being that one unit higher.

TABLE 2.—ADULT MEN—WALES.

NOTE.—The numbers used to denote Eye Colour are those of Professor Martin's Augenfarbentafeln.

PIGMENTATION.	CEPHALIC INDEX. ¹													Per- cent- ages.
	Under 73	73	74	75	76	77	78	79	80	81	82	83	84 and over.	Total.
Hair light, eye dark (darker than 10) ...	1	2	6	5	9	10	5	6	11	5	2	2	1	65
Hair red	3	4	7	19	16	8	21	19	12	10	8	2	3	132
Hair fair or light brown, eye light ...	6	7	24	38	54	58	41	55	38	23	14	17	4	379
Hair dark, eye light (lighter than 10) ...	10	19	34	5	67	76	74	73	54	29	17	13	8	533
Hair dark (but not black), eye dark (10 or darker)	23	20	47	63	61	68	74	71	42	33	22	13	14	551
Hair black, eye dark	8	8	17	23	21	25	20	20	24	10	7	3	6	192
Along this line are given numbers of individuals for each cephalic index ...	51	60	135	207	228	245	235	244	181	110	70	50	36	1852
Percentages	2.75	3.24	7.29	11.17	12.31	13.23	12.69	13.18	9.77	5.94	3.78	2.7	1.94	

¹ We used the Glabella-Maximal Length, and this should be borne in mind in connection with any comparison between our figures and those obtained when the Ophryo-Maximal Length is used. Probably one might allow a difference of rather less than one unit in the cephalic index, the figures if the Ophryo-Maximal is used being that one unit higher.

TABLE 3.—ADULT WOMEN—WALES.

NOTE.—The numbers used to denote Eye Colour are those of Professor Martin's Augenfarbentafeln.

PIGMENTATION.	CEPHALIC INDEX. ¹													Per- cent- ages.
	Under 73	73	74	75	76	77	78	79	80	81	82	83	84 and over.	Total.
Hair light, eye dark (darker than 10) ...	1	0	0	1	2	0	0	2	0	1	0	0	2	9
Hair red	0	0	0	1	0	3	4	3	2	2	2	1	0	18
Hair fair or light brown, eye light ...	1	0	0	7	13	3	10	7	15	5	5	4	2	72
Hair dark, eye light (lighter than 10) ...	3	4	3	8	7	14	6	8	9	13	8	4	5	92
Hair dark (but not black), eye dark (10 or darker)	0	1	6	6	16	18	14	9	17	15	8	7	13	130
Hair black, eye dark	0	1	0	2	2	3	2	2	2	4	2	2	1	23
Along this line are given numbers of individuals for each cephalic index ...	5	6	9	25	40	41	36	31	45	40	25	18	23	344
Percentages	1.45	1.74	2.62	7.27	11.63	11.91	10.47	9.01	13.08	11.63	7.27	5.23	6.68	

¹ We used the Glabella-Maximal Length, and this should be borne in mind in connection with any comparison between our figures and those obtained when the Ophryo-Maximal Length is used. Probably one might allow a difference of rather less than one unit in the cephalic index, the figures if the Ophryo-Maximal is used being that one unit higher.

Figs. 3-5.—Tentative Interpretations of the Map Registers (Figs. 1 and 2).

The figures on these maps give the percentage of the local sample which belongs to a certain group.

These small maps should be studied only in connection with Figs. 1 and 2.

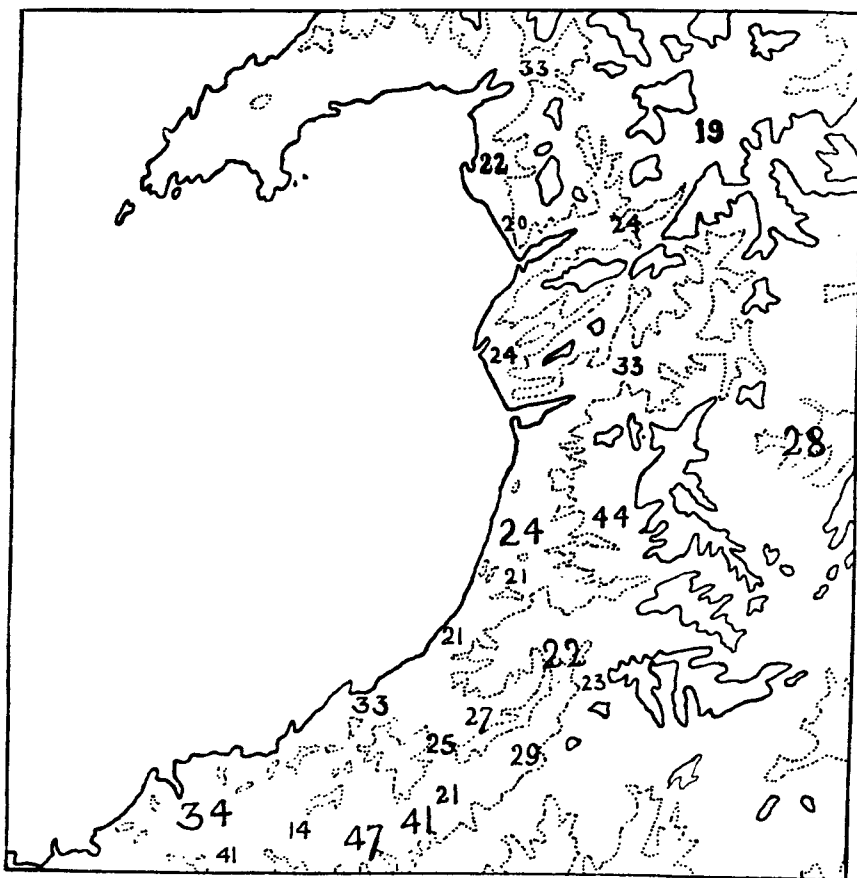


FIG. 3.—PERCENTAGES OF NARROW-HEADED DARK TYPES (a-h OR a-h ON MAP-REGISTERS).

The figures are written large when the local sample is a comparatively large one.

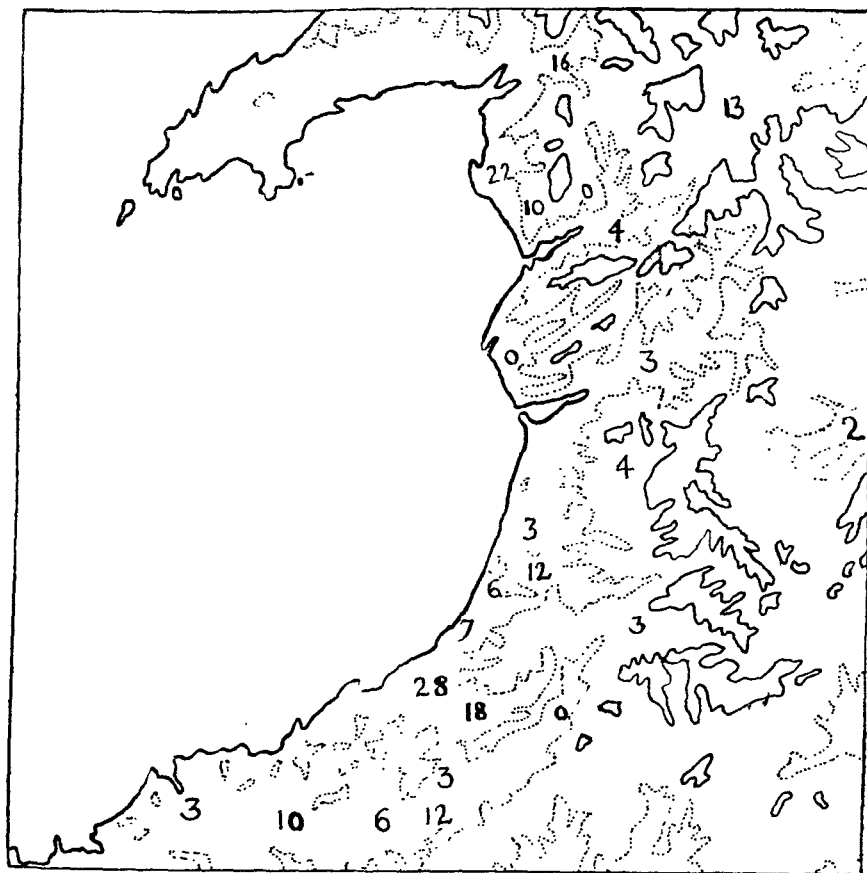


FIG. 4.—PERCENTAGES OF BROAD-HEADED DARK TYPES (l-p or l-p̄ ON MAP-REGISTERS).

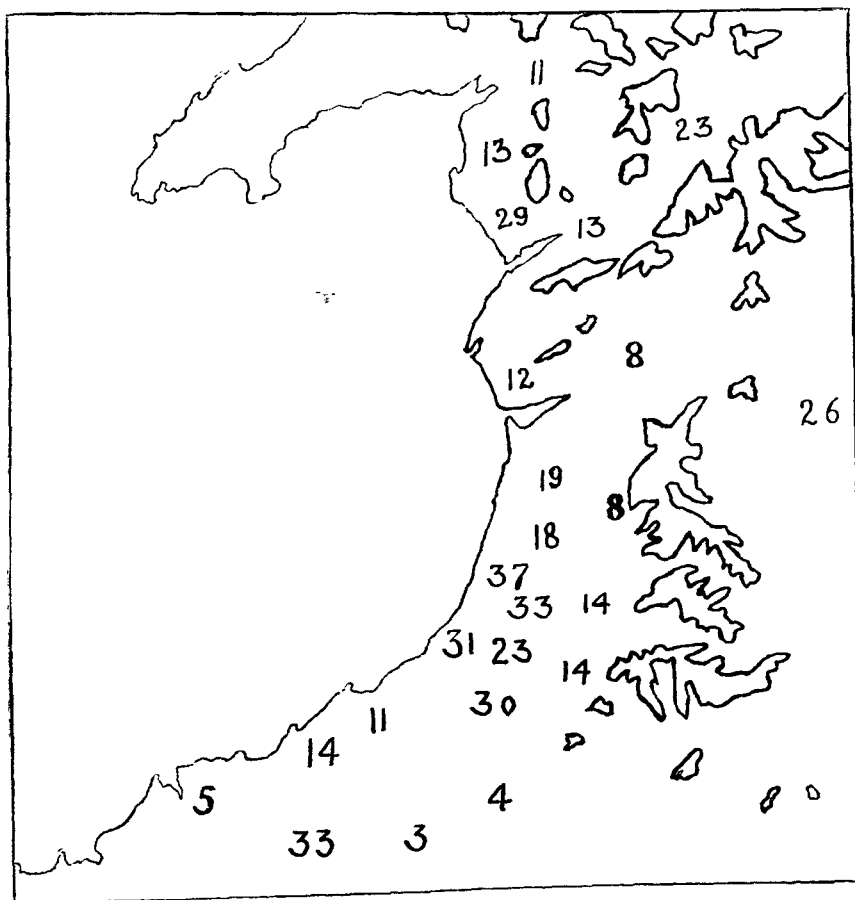


FIG. 5.—PERCENTAGES OF FAIR TYPES.

CARDIGANSHIRE (Figs. 1 and 3-5).

Analyses of Measurements from Plynlymon District.

The Plynlymon Moorlands are such a characteristic district and the results from this district present such interest that it seems well to begin our analyses here.

TABLE 4.—PLYNLYMON MOORLAND.

Adult men, in order of ascending cephalic indices.

(Letters on Fig. 1 enclosed by broken line.)

No.	Age.	Head length.	Head breadth.	Index.	Auric nasal radius.	Auric alveolar radius.	Hair colour.	Eye colour.	Stature.	Map letter. (See Table 1, p. 51.)
1	60	214*	152	71·0	95	97+	dark brown	dark brown	1675	a
2	25	208*	149	71·6	Prognathous†		dark brown	brown	1710	a
3	40	206*	149	72·3	97	100+	black	brown	1685	a
4	35	203*	148	72·9	87	89+	dark brown	dark brown	1690	a
5	56	204	149	73·0	93	96+	red brown	blue	1710	r
6	ad.	203	149	73·4	89	87	dark brown	blue	1650	B
7	30	199*	147	73·8	85	92+	black	grey brown flecked	1715	b
8	ad.	192*	142	74·0	95	94	medium brown	grey brown flecked	1560	d
9	30	200	148	74·0	94	95+	dark brown	grey brown flecked	1675	d
10	29	191	144	75·4	—	—	black	brown	1650	e
11	20	199	150	75·4	93	96+	red	blue	1700	r
12	20	201	152	75·6	—	—	red	brown	1770	r
13	50	191	145	75·9	95	101+	fair auburn	grey brown	1595	r
14	35	194	149	76·1	97	92	red	brown	1650	r
15	50	207	158	76·3	105	102	dark brown to black	dark brown	1750	f (not entered on map)
16	55	205	157	76·6	110	108	dark brown (beard red)	blue	1780	F
17	20	179	138	77·1	82	81	medium brown	dark brown	1725	g
18	24	197	152	77·2	—	—	medium brown	grey blue	1670	G
19	30	197	152	77·2	89	88	dark brown	brown	1700	g
20	25	199	154	77·4	105	100	dark brown	medium	1755	g
21	31	205	161	78·0	—	—	auburn	blue	1715	r
22	22	198	155	78·3	95	90	light	blue	1730	H
23	23	195	148	78·5	—	—	medium brown	brown	1680	h
24	33	203	161	79·3	—	—	black	brown	1665	j
25	59	200	160	80·0	105	103	fair red	blue	1600	R
26	60	191	158	82·7	94	94	light brown	blue	1600	M
27	40	194	161	83·0	80	85+	black	medium	1800	n

In the above list:—

* indicates prominent glabella and a low, receding forehead, accompanying strongly marked occiput.

† indicates prognathism.

NOTES.—Numbers 3 and 4 are brothers.

Numbers 20 and 22 are brothers and are sons of number 16.

The inclusion of close relations in the above fashion is not found except in this table, and is here excusable, as it is so difficult to obtain numbers of men on this sparsely peopled moorland.

The country is in the main a portion of the high plateau which includes a large part of the surface of Mid-Wales; at Pen Plynlymon Fawr it rises to 2468 feet, and the region above 2000 feet is, as is usual in Wales, considerably dissected, with a glacial cirque beneath the summit of the mountain. Elsewhere the country would be a rolling moorland, with great valleys, it is true, if it were not that certain of its streams have been captured by the torrent drainage of its sharp western edge eight miles inland from the coast of Cardigan Bay. These captured streams make their way through the plateau edge in deep gorges with naturally wooded sides, and the conditions are therefore such as to have hampered communications very considerably before the valleys were cleared. This is all the more important as the torrents have eaten their way back right into the heart of this moorland, which is thus cut by deep gorges. Its western edge (about 1000 feet) is higher than the general level a little farther east (900 feet) and the slope down its edge is often very steep until a lower plateau (usually 500–800 feet) is reached. This lower or coastal plateau is a great feature of west and south-west Wales; it is much cut up by streams and it approaches the sea in cliffs or hills, isolated by dissection, that are often 400 feet high. The high plateau and the coastal plateau are therefore somewhat distinct physically and the difference of conditions and difficulties of intercommunication have made them very separate in a human sense from ancient times onwards.

The upper plateau in the immediate vicinity of Plynlymon is almost destitute of roads, and its inhabitants are a few shepherds who cultivate a few of the more favoured spots. There are at present great stretches of peat bogs, but it is probable that much of the region was wooded until Tudor times, though the upper hillsides would usually be too wind-swept, even where they are not too high, for trees. The local stone includes some second-rate grits and various mudstones. It is thus evident that both from the point of view of physical circumstances (the small amount of land free from natural woodland save at great heights) and of that of materials for implements, the Plynlymon moorland was very inhospitable for early man. It would seem to have been a rather isolated refuge, and to this day it keeps itself separate from the life outside, save for the vicinity of the one through-road. In antiquity, while the people of the coast plateau would seem to have had

a good many flint implements from the beaches (glacial drift down the Irish Sea), the moorland folk, if we may judge from a few collections from hut sites, eked out the few coast flints they procured with many poor implements of local grit. A selection of these has been collected by Professor O. T. Jones and Mr. R. U. Sayce, on an ancient hut site near Llechwedd Mawr, Plynlymon, 1912; this is mentioned here by kind permission. The description of these grit objects as human implements is not a very assured one, but as a number of them was found on one and the same hut site, it is fairly probable.

On such a moorland it was difficult to get measurements of large numbers of individuals. The persons enumerated trace their ancestry back on the moorland so far as is known, and in some cases they are able to trace it back very far along several interweaving lines, all within the moorland.

The average cephalic index for these 27 cases is about 76·1 compared with about 78·0 for 1852 adult Welsh men. This lowness of average is due in part to the small number of broad heads and in part to the larger number of very long heads. The two people with really broad heads are very distinct from the rest and may be strays; one almost certainly is a stray, as will be explained later. Without them the average would be as low as 75·6.

On the other hand, as many as 9 out of the 27 have cephalic indices not above 74·0, that is 33 per cent., are extremely longheaded, for 74·0 on the head is 72·5 on the skull. The figures happen to be the same if we take 74·9 as our limit, and we note that for our 1850 cases from the whole of Wales, those with indices that are less than 74·9 form only 13·3 per cent. (against 33·3 per cent. here).

In order to follow this up, the facts on our cards relating to men with indices below 73, observed in any part of Wales, have been tabulated.

TABLE 5.

No.	Age.	Head length.	Head breadth.	Index.	Stature.	District.	Map letter.
1	adult	194	130	67·0	1600	Dyfi	a
2	20	201	135	67·1	1618	Glam.	A
3	38	207	144	69·6	1680	Abergele	A
4	45	212	148	69·8	1775	Llangwryfon	a
5	20	204	144	70·6	1686	N. Cent. Cardiganshire ...	A
6	24	189	134	70·7	1618	Llanidloes... ..	A
7	27	205	145	70·7	1675	Llanidloes... ..	a
8	19	205	145	70·7	1730	Moylgrove	a
9	27	199	141	70·8	1622	S. Carmarthenshire ...	a
10	60	203	144	70·9	1685	Merionethshire	A
11	60	214	152	71·0	1677	Plynlymon	a
12	50	215	153	71·2	1765	Llandyssul	A

TABLE 5.—*continued.*

No.	Age.	Head length.	Head breadth.	Index.	Stature.	District.	Map letter.
13	adult	204	146	71·6	1768	Denbigh and Flint ...	<i>A</i>
14	adult	208	149	71·6	1860	Denbighshire ...	<i>A</i>
15	25	208	149	71·6	1711	Plynlymon ...	<i>a</i>
16	26	198	142	71·7	1702	Clydey ...	<i>a</i>
17	41	202	145	71·8	1730	W. edge Plynlymon ...	<i>a</i>
18	47	196	141	71·9	1768	Denbighshire ...	<i>a</i>
19	19	196	141	71·9	1550	Mixed, Border ...	<i>a</i>
20	43	200	144	72·0	1775	W. edge Plynlymon ...	<i>A</i>
21	21	197	142	72·0	1645	Mixed S. Wales ...	<i>a</i>
22	adult	209	151	72·2	1715	Pembroke... ...	<i>A</i>
23	62	198	143	72·2	1645	Llandrillo ...	<i>A</i>
24	21	201	145	72·3	1695	Llanelly ...	<i>a</i>
25	22	191	138	72·3	1575	Mixed ...	<i>r</i>
26	40	206	149	72·3	1685	Plynlymon ...	<i>a</i>
27	adult	199	144	72·3	1605	Llanidloes... ...	<i>a</i>
28	40	199	144	72·3	1695	Bethesda ...	<i>a</i>
29	20	195	141	72·3	1735	Llanidloes... ...	<i>A</i>
30	22	185	134	72·4	1685	N. Glamorgan and Llanidloes.	<i>a</i>
31	adult	196	142	72·4	1785	Llanidloes... ...	<i>a</i>
32	adult	203	147	72·4	—	Llanelly ...	<i>r</i>
33	20	196	142	72·4	1600	St. Dogmaels ...	<i>A</i>
34	50	197	143	72·6	1670	Llandyssul ...	<i>a</i>
35	adult	209	152	72·7	1820	Abergele ...	<i>a</i>
36	adult	198	144	72·7	1690	Mixed ...	<i>A</i>
37	adult	206	150	72·8	1735	Merioneth coast ...	<i>a</i>
38	adult	202	147	72·8	1645	Caersws ...	<i>a</i>
39	adult	199	145	72·8	1725	Denbigh ...	<i>a</i>
40	21	202	147	72·8	1750	N. Cent. Cardiganshire ...	<i>A</i>
41	adult	192	140	72·9	1750	Merioneth coast ...	<i>a</i>
42	21	199	145	72·9	1720	N. Merioneth coast ...	<i>a</i>
43	35	203	148	72·9	1690	Plynlymon ...	<i>a</i>
44	adult	207	151	72·9	1740	Llangwryfon ...	<i>a</i>
45	adult	188	137	72·9	1695	Llandinam ...	<i>a</i>
46	31	196	143	72·9	1665	Carno ...	<i>A</i>

They number 46 in a survey of about 1850 adult men, *i.e.*, about 2·49 per cent. ; 28 of them are dark in hair and eyes, 2 are red, 10 have more or less dark hair but light eyes, and 6 only are fair.

Of the 28 darks, 4 belong to the Plynlymon moorland itself, 9 more belong to its borders, and one other is of mixed ancestry, partly from Plynlymon borders. In other words, about half of the whole number of dark narrow heads (below 73 C.I.) are connected with the Plynlymon district. Among the non-dark people, none belong to Plynlymon itself, while only 4 out of the 18 belong to its borders. Of these 4, 2 belong to Llanidloes and 1 to Carno, and it is quite certain that the influence of fair-type immigrants has penetrated steadily up the Severn valley towards the aboriginal fastnesses of Plynlymon.

It may be noted for discussion in a later section that 5 of these narrow-headed types come from the borders of the Denbighshire moorland; they all have more or less dark hair, but 3 have light eyes and 2 have dark eyes. It will be seen hereafter that that moorland is another centre for ancient types, though in a lesser degree and of a more mixed character than the Plynlymon and Llandyssul (*v. inf.*) districts.

There is thus abundant reason to suppose that, whatever the reason, the Plynlymon moorland is a nest of extreme dolichocephaly, which usually goes with dark colouring. In the most marked instances there is a noticeable platycephaly and the largeness of the measurements is noteworthy; it is due to prominence of both glabella and occiput. Six cases of marked platycephaly noted here are a considerable justification for this identification of a peculiar type. Thanks to the kindness of Dr. John Beddoe and Dr. A. C. Haddon we have had the advantage of getting copies of slides and photographs of Welshmen from the collection of the former. In this collection were portraits of two celebrities of forty or fifty years ago, one of whom was obviously of this type, while the other also had the type but with some traces of what may be called negroid character (hair of an unusually close curliness, prognathism very marked, and so on). These photographs were shown to Sir John Rhys, in the hope that he might be able to identify them and tell us to what district they belonged. He startled us by saying not only that they were brothers (Plate IV, 5, 6), but that they belonged by birth and ancestry to the western side of Plynlymon. The existence of this type is therefore no chance of the present day, but a feature doubtless of some antiquity in the neighbourhood. We shall venture to call it for the purposes of further argument *the Plynlymon variety* and to describe it by reference to Table 4, No. 1, and the photographs illustrating him (Plate I, 1A, 1B). Before discussing its homologies, reference must be made to another feature of the table. In the list of 27 cases there are 7 with more or less auburn or red hair, while one other is noted down as having a markedly red beard. 25·9 per cent., that is, have red hair, and this occurrence of red hair is a locally well-known fact about the moorland. All save one of these have a cephalic index above 75, and there can be little doubt not only that this type is something quite distinct from the one previously discussed, but that it is also something characteristic of the district.

The percentages of "Reds" (including auburn) in our tables are 7·3 for Wales (men), 5·3 for Wales (women), 7·4 for Cardiganshire, 3·7 for Merionethshire, 12·0

for Carmarthenshire, 9.0 for East Central Wales, 4.7 for Denbigh and Flint, and 7.9 for Carnarvon and Anglesey (men in each case). The percentage (25.9) in the Plynlymon district is thus very unusually high. It would be difficult at present to give an adequate explanation of this, but something which may be more than a coincidence may be suggested here. After the observations had been taken and the above table drawn up, one of us inquired of an archaeologist whether there might be any record or tradition of the Gwylltïaid Cochion Mawddwy (the Red Robbers of Mawddwy) having taken refuge in this desolate moorland when they were dispersed in Tudor times. The reply was that this was a well-established fact known to students of local history. The Mawddwy brigands are known to have been red, and they may have left their physical inheritance in their place of refuge.

Applying an analogical argument from this case, and bearing in mind what has been said about the archaeology of the district, we are inclined to think that the long-headed dark type, which is, as will be seen, the more prevalent type in Wales, is intermingled in this remote refuge with survivors of some older type. The strong development of the glabella and the low receding forehead suggest in a way the Neanderthaloid types, but Keith¹ is probably right in concluding that these are very distinct from the rest of humanity, perhaps even a distinct species.

One notices a possible far-off resemblance to the skulls from Brünn, Dartford, or Galley Hill. The measurements of these skulls would be, perhaps, not unlike those of our first individual (see Plynlymon list). 214 mm. length and 152 breadth, for example, may be taken, using Anderson's² measurements, as corresponding to about 205 and 142-3 on the skull.

The figures³ for the others are Brünn 206, 144, Dartford, 207, 150, Galley Hill, 204, 140, Clichy, 204, 138. The measurements are not unlike those of the Cro-Magnon type (203, 150), but the forehead seems very different.

One imagines that the Galley Hill man, if restored, would show nearly as much recession of the brow as do our Plynlymon types.

The Combe Capelle skull seems to approach our type as well. Most of these, however, are so ancient as to make any serious comparison inexpedient.

We note that Greenwell and Rolleston⁴ figure a skull with strong superciliary ridges, receding forehead, and long head from Langton Wold, but the measurements are rather small. The measurements for our Plynlymon variety are only rarely approached in Davis and Thurnam's⁵ lists in the *Crania Britannica*. Perhaps the Uley skull is the nearest approach among those figured, but the forehead, though

¹ Keith, A., *Antiquity of Man*, 1915, pp. 137-159.

² Anderson, J. H., "On the Relative Thickness of the Cranial Integuments," *Journ. Roy. Anthropol. Inst.*, 1910, p. 272.

³ Keith, A., *Antiquity of Man*, 1915, see p. 69, pp. 160-227, and pp. 137-144.

⁴ Greenwell, W., and Rolleston, G., *British Barrows*, 1877, p. 602.

⁵ Davis, J. B., and Thurnam, J., *Crania Britannica*, 1865, plate 5.

contracted and receding, as in our types, is not at all low. The chin is fairly indicated, as in our types, but the Uley skull does not appear to show much prognathism. The skull from Ledbury Hall (Derbyshire), described by Huxley,¹ has a general likeness to those of our types, but its measurements are smaller. The Borris skull (203 by 150), described by Huxley,¹ is perhaps nearest to our type and is neolithic and Irish. Borlase² notices a large number of cases of "mecistocephalous dolichocephalous platycephaly"³ from skulls and from observations of modern types here and there, and suggests Irish examples, but we think our record is the first mention of a "nest" of this type.

TABLE 6.—ANALYSIS OF MEASUREMENTS.

Llandyssul, Llanfihangel-ar-Arth, Llanwenog, Llan-y-byther, Pencarreg.

(The letters on the map (Fig. 1) are enclosed by a broken line.)

No.	Age.	Head length.	Head breadth.	Index.	Stature.	Map letter.
1	50	197	143	72·6	1670	<i>a</i>
2	20	190	139	73·2	1660	<i>x</i>
3	25	201	149	74·1	1745	<i>d</i>
4	46	203	151	74·3	1710	<i>d</i>
5	36	208	154	74·0	1645	<i>d</i>
6	41	214	159	74·3	—	<i>D</i>
7	33	198	148	74·7	1725	<i>D</i>
8	58	200	149	74·5	1620	<i>D</i>
9	52	200	150	75·0	1650	<i>E</i>
10	33	209	157	75·1	1655	<i>e</i>
11	42	206	155	75·2	1765	<i>e</i>
12	35	198	149	75·2	1700	<i>e</i>
13	28	204	155	75·9	1645	<i>e</i>
14	21	203	154	75·9	1705	<i>e</i>
15	57	195	148	75·9	1645	<i>E</i>
16	29	205	154	75·1	1665	<i>E</i>
17	62	185	140	75·7	1630	<i>E</i>
18	56	200	151	75·5	1780	<i>x</i>
19	41	209	159	76·1	1780	<i>f</i>
20	19	193	148	76·7	1665	<i>f</i>
21	21	202	154	76·2	1720	<i>f</i>
22	55	210	161	76·6	1785	<i>f</i>

¹ Laing, S., and Huxley, T. H., *Prehistoric Remains of Cuithness*, 1866, p. 114, and pp. 125-6.

² Borlase, W. C., *Dolmens of Ireland*, 1896, p. 922.

³ This means a condition of extreme narrow-headed long-headedness combined with the possession of a low, receding brow.

TABLE 6.—ANALYSIS OF MEASUREMENTS.—*continued.*

No.	Age.	Head length.	Head breadth.	Index.	Stature.	Map letter.
23	54	193	148	76·7	1565	<i>f</i>
24	20	203	156	76·8	1730	<i>f</i>
25	23	196	150	76·5	1670	<i>F</i>
26	60	198	152	76·8	1600	<i>f</i>
27	59	196	150	76·5	1705	<i>r</i>
28	35	197	150	76·1	1670	<i>r</i>
29	adult	193	148	76·7	1715	<i>r</i>
30	56	195	149	76·4	1870	<i>x</i>
31	52	200	155	77·5	1675	<i>g</i>
32	61	197	152	77·2	1675	<i>g</i>
33	44	195	152	77·9	1630	<i>g</i>
34	39	206	159	77·1	1680	<i>g</i>
35	22	199	155	77·9	1670	<i>G</i>
36	47	199	155	77·9	1730	<i>G</i>
37	49	197	152	77·2	1650	<i>x</i>
38	22	198	156	78·8	1735	<i>h</i>
39	21	198	155	78·3	1775	<i>h</i>
40	48	188	148	78·7	1675	<i>h</i>
41	20	193	151	78·3	1665	<i>h</i>
42	24	193	153	78·3	1710	<i>H</i>
43	26	205	161	78·6	1660	<i>r</i>
44	22	201	158	78·6	1705	<i>r</i>
45	19	194	154	79·4	1725	<i>J</i>
46	19	192	153	79·7	1675	<i>J</i>
47	28	199	159	79·9	1725	<i>J</i>
48	63	198	157	79·3	1680	<i>j</i>
49	25	201	159	79·1	1755	<i>j</i>
50	30	191	153	80·0	1720	<i>K</i>
51	56	203	163	80·3	1665	<i>K</i>
52	25	189	152	80·4	1780	<i>k</i>
53	37	212	171	80·7	1750	<i>k</i>
54	19	193	157	81·3	1615	<i>l</i>
55	19	185	151	81·6	1710	<i>l</i>
56	43	198	163	82·3	1715	<i>m</i>
57	44	188	156	83·0	1635	<i>n</i>
58	21	181	152	84·0	1710	<i>p</i>

At an early stage in our work we saw that the Llandyssul district (South Cardiganshire) possessed numbers of dark dolichocephals. A conversation with a

local hatter in the small market-town brought out the fact that special shapes have to be ordered because of the projecting occiput very common in the district. 58 adult men who trace back their ancestry on both sides in the neighbourhood of Llandyssul and Llanwenog are enumerated. Their stature and head lengths and breadths, and letters denoting their colouring, are given in the accompanying table, extracted from our cards giving detailed information about each. It may be well to repeat that the number of persons measured here was much larger than 58, was much above 100 in fact, but 58 was the number of "concentrated samples," *i.e.*, of people who belong entirely to this district by ancestry two generations back at least.

Of these, it will be noticed that 33 are distinctly dark, while 14 have more or less dark hair but light eyes. Only 2 medium to broad headed men are pure fair, 5 have the anomalous combination of light hair and dark eyes, four are red.

The great scarcity of fair types is the most noteworthy fact. The next is that 24 of the above-mentioned 33 and 11 of the 14 have head indices below 79, *i.e.*, may be said to be distinctly dolichocephalic, for 79 on the head is 77.5 on the skull.¹

Llandyssul, etc., is thus distinctly a region for dark dolichocephals.

Comparing the table with that for Plynlymon, we note that here only 2 out of 58 have indices below 74, whereas in the Plynlymon case the number was 7 out of 27. In the Llandyssul case the projection of the glabella was not very noticeable, neither was platycephaly at all marked. The Plynlymon variety is thus seen to be a type slightly different from that characteristic of Llandyssul.

The following *résumé* of the cases of dark men on our table will be useful:—

Cephalic index.	Head length.
72-72.9	197
73-73.9	—
74-74.9	201, 203, 208
75-75.9	209, 206, 198, 204, 203
76-76.9	193, 202, 210, 193, 203, 198, 209
77-77.9	197, 195, 206, 200
78-78.9	198, 198, 188, 193
79-79.9	198, 201
80-80.9	189, 212 (an abnormally large head in every way)
81-81.9	193, 185
above 82	188, 181, 198

¹ Having studied Anderson's article, "On the Relative Thickness of the Cranial Integuments" (*Journ. Roy. Anthropol. Inst.*, 1910, p. 272), we think an allowance of 1.5 is sufficient when comparing the breadth index for the skull with that for the living head, using the glabellomaximal length in both cases.

A characteristic group is that with cephalic indices 74–75.9. Of the 8 only 1 has a head length below 200 mm., whereas a measurement above 200 mm. becomes exceptional once the limit 77 is passed. The average of the 8 cases is 204, and a head of such length owes that length probably mainly to the size of the occipital projection. One may contrast this with the average length of 208 for the 4 extreme dolichocephals with flat heads and prominent glabellæ in the Plynlymon region.

The radial measurements showed that prognathism was frequent but not general.

The average stature for these eight characteristic cases is about 1695–1700 mm., *i.e.*, is about average (just under 5 feet 7 inches).

Among other facts from the cards we note the straightness of the nose, and a tendency towards swarthinness of complexion.

We therefore describe a Llandyssul variety with head length approximating to 204, head breadth to 153, head index to 75, stature about 1695 mm. Glabella not prominent, occiput well marked, nose straight, complexion inclined to swarthinness.

Those in our table who are not pure dark are probably in several cases merely modified through partial loss of eye pigment. Two of the reddish fair types have aquiline noses, and may perhaps be compared with certain Merionethshire types (*v. inf.*).

The percentage of red-haired men is 6.9, which is just below an average value and does not call for special comment. We note, however, that their cephalic indices are all above 76. The reds in the Plynlymon district were all above 75, save one.

Rolleston¹ states that an antiquary viewing Canon Greenwell's series of skulls would note that they could be separated into two groups. That made up of skulls from Bronze Age sepultures would show both dolichocephalic and brachycephalic skulls, the latter belonging to men of more powerful build than the former. That made up of skulls from Stone Age sepultures would show only dolichocephalic skulls. On p. 630 he says that Tacitus (*Agricola* XI.) speaks of the Silures as dark, and he adds that the modern black-haired type of the west is shorter in stature, feebler in development, and longer in skull form than the lighter haired and lighter complexioned variety. Rolleston therefore speaks of the longer skulls found with shorter skeletons, but in the long barrows and to the exclusion of brachycephalic forms, as belonging to this Silurian type. In this statement Rolleston was confirming the suggestions made long before by Professor Daniel Wilson. This view, here summarized from Rolleston, is now almost universally accepted.

Our work seems to support the approximation of the "Stone Age people" and the ancient and modern Silures of South Wales, as well as the other groups of

¹ Greenwell, W., and Rolleston, G., *British Barrows*, 1877, p. 627.

dark dolichocephals found in various parts of Wales, which is generally accepted, and we think it possible to go farther and to learn something of the factors which have promoted survival of this type in certain districts.

Remoteness and inhospitable character of the country are not sufficient to account for survival groups. They may be sufficient to account for survivals of this type, intermingled with one or more even older ones, on the Plynlymon moorland; but the Llandyssul and Llanybyther country, though admittedly "far west," is by no means so remote or so inhospitable as to be noteworthy in that respect. On further analyses of our cards we found another centre of this ancient type in the valleys cutting the landward edges of the moorland hills known as Mynydd Hiraethog in West Denbighshire.

TABLE 7.—THE DENBIGHSHIRE UPLAND (LANDWARD EDGES).

No.	Age.	Head length.	Head breadth.	Index.	Stature.	Map letter.
1	38	207	144	69·6	1680	<i>A</i>
2	adult	208	149	71·6	1860	<i>A</i>
3	47	196	141	71·9	1770	<i>a</i>
4	adult	209	152	72·7	1820	<i>a</i>
5	adult	199	145	72·8	1725	<i>a</i>
6	24	195	143	73·3	1830	<i>b</i>
7	adult	201	149	74·1	1580	<i>d</i>
8	53	190	141	74·2	1670	<i>d</i>
9	adult	198	147	74·2	1670	<i>D</i>
10	30	196	147	75·0	1665	<i>e</i>
11	19	201	151	75·1	1770	<i>e</i>
12	adult	186	140	75·3	1670	<i>E</i>
13	27	199	150	75·4	1610	<i>e</i>
14	42	195	147	75·4	1685	<i>E</i>
15	adult	204	154	75·5	1775	<i>x</i>
16	32	196	148	75·5	1585	<i>E</i>
17	adult	199	151	75·9	1615	<i>E</i>
18	30	204	155	76·0	1670	<i>F</i>
19	adult	192	146	76·1	1650	<i>f</i>
20	24	197	150	76·1	1760	<i>f</i>
21	24	201	154	76·6	1700	<i>f</i>
22	38	195	150	76·9	1740	<i>f</i>
23	adult	199	153	76·9	1680	<i>f</i>
24	21	194	148	76·3	1635	<i>r</i>
25	42	200	154	77·0	1720	<i>g</i>
26	45	192	148	77·1	1615	<i>G</i>

TABLE 7.—THE DENBIGHSHIRE UPLAND—*continued.*

No.	Age.	Head length.	Head breadth.	Index.	Stature.	Map letter.
27	adult	197	152	77·2	1630	G
28	38	198	153	77·3	1680	g
29	41	193	149	77·3	1735	g
30	adult	205	159	77·6	1745	g
31	29	193	150	77·7	1625	G
32	24	194	151	77·8	1780	g
33	adult	199	155	77·9	1740	g
34	53	191	149	78·0	1750	r
35	adult	190	149	78·4	1600	H
36	40	187	147	78·6	1695	h
37	40	192	151	78·6	1650	H
38	adult	193	152	78·7	1820	H
39	25	190	150	78·9	1710	h
40	adult	190	150	78·9	1660	h
41	adult	194	153	78·9	1675	h
42	47	193	153	79·3	1670	j
43	30	189	150	79·4	1675	J
44	40	189	150	79·4	1610	j
45	32	187	149	79·7	1600	j
46	20	189	151	80·0	1700	k
47	adult	195	157	80·5	1635	k
48	adult	192	156	81·2	1630	l
49	52	188	153	81·4	1645	L
50	30	189	155	82·0	1635	M
51	25	186	161	86·6	1885	R

This collection of fifty-one adult men with ancestry entirely on Mynydd Hiraethog and its valleys, and not at all in the Vale of Clwyd, is interesting in its resemblances to and small differences from the results gathered in the Llandyssul and Llanybyther district and in the Plynlymon region.

	Denbighshire moorland (landward edge).	Llandyssul, etc.	Plynlymon district.	Wales (men).
No. of cases	51	58	27	1850
Average cephalic index ...	77·0	77·6	76·1	78·0
Dark colouring	30 cases, <i>i.e.</i> , 58·8 per cent.	33 cases, <i>i.e.</i> , 56·9 per cent.	15 cases, <i>i.e.</i> , 55·5 per cent.	40·0 per cent.
Dark hair and light eyes ...	11 cases, <i>i.e.</i> , 21·6 per cent.	14 cases, <i>i.e.</i> , 24·1 per cent.	3 cases, <i>i.e.</i> , 11·1 per cent.	28·8 per cent.
Light colouring... ..	5 cases, <i>i.e.</i> , 9·8 per cent.	2 cases, <i>i.e.</i> , 3·5 per cent.	2 cases, <i>i.e.</i> , 7·4 per cent.	20·5 per cent.
Red hair... ..	3 cases, <i>i.e.</i> , 5·9 per cent.	4 cases, <i>i.e.</i> , 6·9 per cent.	7 cases, <i>i.e.</i> , 25·9 per cent.	7·3 per cent.

These three districts are thus distinctly darker than the average in colouring, the proportion of fair types being distinctly low. The average of cephalic indices is lower in each of these districts than it is for the whole country, and this is due to the marked predominance of the dolichocephalic types. The average for the Denbighshire moorlands would be lower if one omitted an obvious stray, No. 51, a red-haired man with index 86·6. In the Llandyssul case, again, one could reduce the average by omitting the rather isolated types Nos. 56, 57 and 58, with indices 82·3, 83·0 and 84·0 respectively. In the Plynlymon case Nos. 26 and 27 are isolated types with indices 82·7 and 83·0 respectively. The more distinctly broad heads are thus separated off from the general mass of the population in each case, and among the latter even moderately broad heads are uncommon.

The Denbighshire moorland is interestingly like the Plynlymon region in having a good number of people with cephalic indices below 73. Five among 51 is 9·8 per cent. as against 4 among 27, or 14·8 per cent. in Plynlymon district. The corresponding percentage for the whole of Wales is 2·75 per cent. The Denbighshire individuals, however, do not show the marked platycephaly which was so notable at Plynlymon, and the glabella is not so prominent among them. In Denbighshire we may thus say that the probable palæolithic admixture is less marked than it is on the Plynlymon moorland. The Denbighshire men, again, do not show the constancy of high head length that was noted especially among the dark men with indices 74 and 75 at Llandyssul. The majority in the Denbighshire case, apart from those with indices below 73, have the head length below 200.

The lowest index accompanying light colouring is 75·3 in the Denbighshire case, and the narrowest-headed red has an index of 76·3. These two characteristics do not appear to have any correlation with the more decidedly dolichocephalic character, a conclusion which we think has some importance both in connection with the definition of the fair types and in connection with the study of red hair and its inheritance. In the Plynlymon case all save one of the red heads have indices above 75, and at Llandyssul the narrowest-headed red has the index of 76·1.

On the whole the Denbigh moorland must be set down as a centre for neolithic stock, and here again extreme remoteness from "English" pressure cannot be postulated.

We have also ascertained beyond doubt that, as is generally accepted, a closely allied variety is common in the older established populations (Silures) of the coal valleys of Glamorgan and Monmouth, though we have intentionally avoided a "measurement campaign" in these districts, as it is so difficult to get useful details of family history in such an industrialized population. We have chosen a few individuals from the coal valleys of these southern counties as illustrating the type, and we give the following details. We would emphasize the fact that here alone has there been selection of types to be measured:—

Age.	Index.	Head length.	Head breadth.	Stature.	Face.	Map letter.
21	73·2	202	148	1700	Long—medium	b
40	73·6	197	145	1680	Long—medium	b
21	74·7	198	148	1725	Long	d
20	75·5	192	145	1690	Long	e
60	76·6	210	161	1630	Long	f

We think that, were it practicable to take large series of measurements of truly indigenous types, they would be found to approach the above examples closely. The last, it should be noted, was a man of super-normal ability and measurements.

If an extended series from the Glamorganshire and Monmouthshire coal valleys were compared with the Llandyssul and the Denbighshire series, it would probably be found that the men in the former were rather shorter, of somewhat smoother facial contour, and, in healthy surroundings, of fresher colour than those in the latter.

The men in these three districts of the Hiraethog (Denbighshire), Llandyssul-Llanybyther, and the Coal Valleys we therefore claim to show as a predominant type, the long head with dark colouring and moderate stature. How far this may be claimed to be a local type will be judged better after inspection of our tables for Ardudwy, the Bala cleft, New Quay, Llanidloes, etc.

The fact of the survival of ancient types in special numbers in these districts long remained a puzzle to us, as they are by no means the remotest parts of Wales, neither can they be said to be "farthest west." The theory of displacement under westward pressure having been set aside, another hypothesis developed in unsuspected fashion through another geographical inquiry which may be mentioned briefly.¹

The boundary between Cardiganshire and Carmarthenshire for some distance is the River Teifi, a strong, swift river, with a deep trench-like valley in the vicinity of Llandyssul. To north and to south are wide-spreading uplands which the river divides. They are now sparsely peopled, and the population is gathered in hamlets and a few villages near the river-bridges or along the riverside road and its junctions with roads from tributary valleys. It thus happens that some aggregations of population, especially those around bridgeheads, are partly in one county (Cardiganshire to the north of the river) and partly in another (Carmarthenshire to the south of the river), and the arrangement is manifestly inconvenient for modern administration.

The boundary is a very old one, and we get a hint of its meaning in the stories, which state that Ceredig, one of the sons of Cunedda, probably between

¹ Fleure, H. J., *Archaeologia Cambrensis*, April, 1913, p. 153.

the sixth and the eighth centuries, overran the country as far south as the Teifi valley and founded the kingdom of Ceredigion, while, later on, his descendants further overran the country between the Teifi and the Towy (North Carmarthenshire).

The suggestion here is that the Teifi valley was an obstacle to be crossed, whereas nowadays it would be a line of penetration and of communication. The prime factor of this difference is probably that, before man interfered, the valley sides were forested while the valley bottom was a mixture of woodland and swamp, save where it was rocky with a roaring torrent. In the woodland, also, would roam the wolf and boar. The upland, on the other hand, would be kept bare of trees by the free course of the sea-winds over it.

The uplands north and north-west of the Teifi, and also the upland to the south of the Teifi, would thus have formed fairly natural and distinct units in early times, before man was sufficiently equipped to attack and destroy the damp woodland and its wild beasts.

This view is supported by the fact that the uplands possess what are almost certainly ridgeways (ancient tracks), with hut sites, tumuli, standing stones, earthworks and other evidences of their former value and importance. The earthworks in many cases are seen to have stood out on promontories overlooking and projecting into the valley woodland, *e.g.*, Dinas Cerddin above Llandyssul.

Other support for this view is also available:—

1. There are other cases of river boundaries which may not suit modern convenience but are retained as a heritage, *e.g.*, the Conway between Carnarvonshire and Denbighshire, and the Wye as a boundary of Radnorshire.
2. Old administrative divisions often take their names from what are now relatively unimportant farms, earthworks, etc., on the upland, *e.g.*, the hundred of Moeddyn in South Cardiganshire and Kittwr in South Glamorganshire.
3. The divisions of old parishes, the sites of old parish churches, and many other facts help to emphasize the former importance of the upland plateau as against the valley, in Wales.

The general conclusion, then, is that whereas in modern times man occupies the valleys, drains and cultivates them, and makes them his lines of communication, building his villages, towns and cities at their nodes, in ancient times they were barriers. Especially was this the case in the days when he still had only stone, wood and bone tools. He was ill-equipped to cope with the wolf-haunted woodland and the ague-infested swamp, and was thus restricted to the uplands for his settlements. A map of the distribution of population in South Britain in the Stone Age would thus be very nearly the converse of a corresponding map for the present day. Then, speaking broadly, the population, save for the coastal fringe,

would be in large part above the 400 or the 500 feet contour line at least; now the great majority of people live at a lower level. A very similar hypothesis has been worked out by E. Kitson Clark,¹ as we have since learned, and of course it underlies a great deal that has been written elsewhere.

The hypothesis needed to be developed one step farther before it became really valuable in connection with the study of distribution of human types, and helped to show why the uplands specially discussed above were the characteristic nests of the ancient stocks.

The Welsh uplands show considerable natural differences. In Montgomeryshire, for example, the whole valley system, and with this the upper limit of shelter, is higher than it is near the sea. Moreover, the sea winds and their salt have less power than on the coastal plateaux. For these reasons the natural tree-limit tends to be higher inland, and the primevally open country would thus be very cold and bleak, especially considering its distance from the tempering influences of the sea in autumn and winter. On many parts, however, the woodland must have been a fairly open one.

The inland plateaux in Wales, for the most part, had another disadvantage in ancient times. Wales is largely built of grits and shales of Palæozoic age which are most difficult to chip, and also do not easily grind down into sharp-edged forms. On the other hand, the sea beaches of Wales possess accumulations of flint sorted out, with many other foreign pebbles, from boulder clay brought into the Irish Sea and Cardigan Bay by the great ice-sheets which travelled southward down the Irish Sea in the Ice Age. Indeed, the existence of enormous quantities of these materials along the modern shores of Cardigan Bay hints strongly that there was once a large stretch of boulder-clay land, perhaps what would be called in Welsh a "morfa," in what is now Cardigan Bay. That it lasted on into human times is further hinted by the well-known legend of the "Cantref-y-Gwaelod," or "Lowland Hundred," elaborated by Thomas Love Peacock in *The Misfortunes of Elphin*. Still further, the beaches, estuaries and pools of the lowland afforded food supplies of considerable value, perhaps especially in winter.

We thus see that the uplands near the coast of Wales were on the whole far more favourable locations for, let us say, Stone Age man than were those farther inland. Their moderate elevation, their freedom from dense woodland, their flint and food supplies on the beaches and in the low river-reaches and estuaries, all contributed to their value. The coast also afforded a line of intercommunication, perhaps permitting such spreading of implements and material as would account, for example, for our finding a (ground) stone axe made of rock occurring at or near St. David's Head (Doleritic rock) at a place near Ystrad Meurig in North Cardiganshire.

¹ Clark, E. Kitson, "A Prehistoric Route in Yorkshire," *Proc. Soc. Antiquaries London*, 1911, 2 S., xxiii, 309.

It is beyond our present province to discuss whether fine chipping of flint and stone grinding are equally old, or whether the former is the older in this country; but it may be pointed out that the ability to grind implements down carried with it the possibility of population settling in greater numbers on the ancient hard rocks of the Border (Breidden, Corndon, Long Mountain, Longmynd).

The general conclusion, thus far, is that the ancient population was most concentrated on the more extensive uplands near the coast. Now this includes the uplands near the various locations of the survival groups already mentioned (Fig. 6).

1. Between the remarkable parallel valleys of Glamorganshire and Monmouthshire run lines of moorland top, rising, it is true, to considerable heights (1800 and 1900 feet in some cases), but for the most part sloping sunward and seaward, and thus both warmed and kept fairly clear of trees. Mynydd Margam and Mynydd Gelligaer may be mentioned specially. In each case there seems ample evidence of early importance of the moorland, and of a valleyward shift of the population.
2. Between Teifi and Towy is the upland, deeply seamed by river gorges, which rises into the Prescelly Hills and goes out seawards to St. David's Head. It is mostly at a moderate height. Here again are abundant traces of prehistoric importance.
3. South Cardiganshire is a most characteristic coastal upland with the same evidences of upland life.
4. Behind Aberystwyth are characteristic fragments of the coastal plateau projecting like fingers from the higher plateau inland (Plynlymon district) and possessing ridgeways, earthworks, etc., etc.
5. The Hiraethog district of Denbighshire shows the same characteristics as the above, save that its slope down to the sea is of course northward.

It will now be perceived that the argument may be carried a step farther. We claim that the existence of neolithic survivals in considerable numbers in these districts is due to the persistence of these types near their early and natural locations, and to their valleyward movement from such locations. In other words, we claim the hypothesis of long persistence or resurgence, almost, if not quite, *in situ*, as the most valuable hypothesis for explaining the distribution of racial types in Wales.

It should be stated that, after working out these facts some years ago, we found that Abercromby¹ and Peake² had attained a very similar point of view by different roads. They had traced the "Bronze Age pottery" along the Downs of

¹ Abercromby, J., *Bronze Age Pottery*, 1912, especially p. 81.

² Peake, H. J. E., *Memorials of Old Leicestershire*, p. 32 ff.

South England, and suggest that the Midlands were then almost uninhabited, so that the site of importance "next" to the Downs is the High Peak. One question arises concerning other locations of early man, in Wales and in England as well, which do not appear to be characteristic spots for neolithic types nowadays. Such are Anglesey, the Downs of South England, the Vale of Glamorgan, etc. In nearly every such case we find that the district is open to invasion, or has obviously been a line of invasion, particularly from the sea, and we shall find certain other characteristic types in these areas.

In conclusion of this particular argument we may state that we have evidence of the presence of the neolithic types around the inland plateaux (especially in North Montgomeryshire) as well as around the coastal ones here discussed, but the discussion of general distributions is postponed till the scheme of observation now being carried out is completed.

It should be noted that the Welsh uplands, on the hypothesis worked out above, would be very definitely separated from the English ones by the basins of the Dee and the Severn, which would act as barriers. A probable line of connection would exist between Barry and the hills near Weston, but otherwise the Glamorganshire hills would be very isolated from the country of the Cotswolds, etc. We can thus understand the more readily the persistence in a very marked degree of the dark, dolichocephalic people who are, without any doubt, the people described under the name of Silures by Tacitus. Abercromby says that his types of pottery were late in reaching Wales.

Between the Dee basin on the north and the Severn basin on the south are fragmentary uplands: the Breidden hills, the Long Mountain, Longmynd, Wenlock Edge, Brown Clee, Wrekin, Cannock and other Chases, and so on. Perhaps it was along these that influences and waves of population had to spread into Wales in early times, unless they came along-shore, or by sea, as they must have done in some cases.

The fragmentary route here suggested leads towards the North Montgomeryshire plateau, a circumstance not without interest in connection with the occurrence of certain types of man in the Bala Cleft (*vide infra*) just to the north.

The above argument is worked out in more detail in its general bearing as regards the early centres of population and the valleyward movement of people in another article.¹

Analysis of the Tregaron District Tables. (p. 76.)

In these tables we give details of thirty-four men who belong to this district by descent, and it is at once seen that the table differs markedly from that for Llandyssul, for example.

¹ Fleure, H. J., and Whitehouse, W. E., "Early Distribution and Valleyward Movement of Population in S. Britain," *Archaeologia Cambrensis*, 1916.

The proportions of dolichocephalic darks (index below 79) is interesting in comparison with that found for Plynlymon and for Llandyssul.

	per cent.		per cent.
Tregaron district, 10 out of 34 = 29·4.		Total of darks, 11 out of 34 = 32·4.	
Llandyssul „ 24 „ „ 58 = 41·4.		„ „ „ 33 „ „ 58 = 56·9.	
Plynlymon „ 13 „ „ 27 = 48·2.		„ „ „ 15 „ „ 27 = 55·5.	

The proportion of dark dolichocephals is thus much lower than in these other cases.

In the Llandyssul table, on the other hand, there is practically only one man who is entirely fair, while there are six of them on our Tregaron list. Of these fair types one only (73·2) has a cephalic index below 78, showing that, as elsewhere, the more pronounced dolichocephaly is in Wales only rarely associated with fair colouring. The “Reds” are the most interesting of all the groups.

Tregaron district, 9 out of 34 = 26·5 per cent.
Llandyssul „ 4 „ „ 58 = 6·9 „ „
Plynlymon „ 7 „ „ 27 = 25·9 „ „

Tregaron, therefore, deserves the name of a “Nest of Red Hair,” and it is to be noted (see map) that red hair is not specially marked in the country round about.

This conclusion supports popular opinion, which associates fair-red hair, accompanied by rather broad faces and strong zygomatic arches, with the Tregaron people. As to the zygomatics our measurements, perhaps, give some slight support to this popular belief, for whereas in the twenty-five non-red individuals the bizygomatic breadth is 90·1 per cent. of the head breadth, in the nine reds it averages 91·6 per cent. This, however, is a point it would not be wise to emphasize, especially as one knows how often the zygomas project because of the more or less sunken condition of the cheeks below.

It is worth noting that seven out of the nine reds at Tregaron have indices of 77·0 and over, only two being markedly dolichocephalic (73·6 and 74·7). This is similar to what was noted for Llandyssul and Plynlymon. Six out of the nine have large heads (maximum length 200 mm. or over). Prognathism does not seem to be associated with red hair here but several of the subjects have brown flecks, at least, in their eyes.

In the case of Plynlymon district, an archæological speculation showed one possible origin of the “Red Nest,” but the existence of well-marked fair and dark types side by side without marriage-barriers is a characteristic of both districts. Some suggest, in a tentative way, that redness of hair appears where light and dark are crossed, perhaps where they are crossed repeatedly; perhaps one particular dark type is more specially concerned.

TABLE 8.—TREGARON AND LLANDDEWIBREFI DISTRICT.

(The letters on the map, Fig. 1, are enclosed by a broken line.)

Bizy. = Bizygomatic Breadth.

Per. H.B. = Percentage Bizygomatic Breadth to Head Breadth.

No.	Cephalic index.	Head length.	Head breadth.	Stature.	Age.	Map letter.	Bizy.	Per. H.B.
1	73·2	209	153	1630	61	B	145	95·2
2	73·6	197	145	1675	32	<i>r</i>	137	94·5
3	74·6	205	155	1715	24	<i>d</i>	141	91·0
4	74·1	201	150	1740	27	<i>d</i>	129	86·0
5	74·7	202	151	1650	21	<i>r</i>	135	89·4
6	74·8	187	140	1700	22	<i>D</i>	125	89·3
7	75·0	200	150	1760	21	<i>e</i>	136	90·7
8	75·1	205	154	1590	54	<i>e</i>	141	91·6
9	75·5	192	145	1680	19	<i>e</i>	137	94·5
10	76·0	200	152	1600	32	<i>f</i>	138	90·8
11	76·0	204	155	1745	56	<i>f</i>	143	92·3
12	76·9	199	153	1700	21	<i>F</i>	140	91·5
13	77·0	200	154	1740	22	<i>r</i>	137	89·0
14	77·2	206	159	1735	55	<i>r</i>	148	93·0
15	77·3	203	157	1675	34	<i>G</i>	140	89·2
16	77·4	195	151	1815	29	<i>g</i>	138	91·4
17	78·1	206	161	1800	27	<i>r</i>	144	89·4
18	78·5	196	154	1870	21	H	138	89·6
19	78·5	196	154	1740	19	<i>r</i>	142	92·2
20	78·5	195	153	1735	20	<i>H</i>	130	85·0
21	78·7	193	152	1705	23	<i>h</i>	137	90·1
22	78·7	189	149	1555	61	<i>h</i>	131	88·0
23	78·9	199	157	1755	28	H	143	91·1
24	79·2	207	164	1775	adult	<i>J</i>	141	86·0
25	79·5	200	159	1745	48	J	154	96·9
26	79·7	192	153	1625	20	J	136	88·9
27	80·1	191	153	1705	23	<i>x</i>	132	86·3
28	80·1	191	153	1630	30	k	135	88·2
29	80·4	194	156	1710	24	<i>K</i>	140	89·7
30	81·1	191	155	1630	adult	<i>L</i>	140	90·3
31	81·2	208	169	1765	24	R	150	88·8
32	81·3	204	166	1800	33	R	150	90·4
33	81·4	188	153	1675	26	L	136	88·9
34	81·5	195	159	1680	65	R	154	96·9

Notes on other Characteristic Samples from Cardiganshire (Tables 9-11, pp. 79 and 80).

1. Newcastle Emlyn.—Our sample from this neighbourhood is unfortunately small, as so many of the people measured here were of mixed descent or immigrants, that is, had ancestors (usually grandparents) from other parts of Wales. Of the twenty-one accredited to our sample, eight are distinctly fair, *i.e.*, 38·1 per cent., and this sample therefore offers a very marked contrast to that from Llandyssul, especially as there are here comparatively few native dark dolichocephals. At Llandyssul the native fair types were only two among fifty-eight, *i.e.*, 3·5 per cent.

From our cards we have further sorted out eleven relating to men whose ancestry is traceable in part in the Newcastle Emlyn district. Of these eleven, four are fair, and there is the same scarcity of the dark dolichocephals. It is noteworthy, too, that reds are uncommon, one among the twenty-one and none amongst the eleven having this character. Among the twelve fair individuals only one has an index (74·8) below 76.

In spite of the smallness of numbers there is thus ground for endorsing the current opinion concerning the local type. The district is a nest of a fair-haired, blue-eyed stock. The type is fine featured and well built, often tall, and the zygomatic arches are not prominent as they are in the Tregaron stock. (In the eight fair men the bizygomatic breadth averages only 87·8 per cent. of the head breadth.) In fact these Newcastle Emlyn people suggest a rather Scandinavian or Nordic type and they are quite distinct from most of their compatriots physically, so much so that they are rarely taken to be Welshmen by those who see them elsewhere. They resemble the type so often found among the leisured and sporting classes in England. Our cards show that in several cases the ancestry is fair on both sides, and it is said that the type has a distinct preference for mating in its own colouring.

A very tentative suggestion may be offered as to the existence of this "Scandinavian" nest, but it is offered not so much as a hypothesis as to hint at lines of archæological inquiry.

Newcastle Emlyn is a hill almost isolated by the looping of the River Teifi. It is, as it were, split off from that large moorland to the north, which, in considering Llandyssul, we have argued was an ancient home of dark dolichocephals. Elsewhere along the river's course from the mouth up to Llandyssul there are few such isolated defensible sites available for settlement. It is thus just possible that intruders from the sea, penetrating up the river, might seize this hill and hold their own here without necessarily having gained possession of the moorland. An earthwork on the northern side of the river-mouth, on a low promontory, has been ascribed to Norsemen, and its features certainly suggest that it was possessed by owners of boats, but this is not evidence of any value, pending examination of some graves on this earthwork, as to provenance of the occupiers. Whether inquiry concerning place-names, dialects, customs, etc., would bring

support for the hint thrown out or whether some alternative hypothesis, perhaps of settlement or garrisoning by transport from Pembrokeshire, would not be better, is a matter that must be left for the present.

2. Newquay.—The little sample of eighteen men of Newquay descent has some points of considerable interest. In spite of its being on a coastal bay suitable for anchorage, Newquay is by no means distinguished for "Scandinavian" types, only two of our samples being referable to this. On the other hand, eight of the eighteen have cephalic indices of 80 and above, and seven of these eight are distinctly dark, *i.e.*, 44·4 per cent. of the sample have indices of 80 and above, and 39 per cent. are "dark broads."

					Indices of 80 or above.	"Dark broads."
					Per cent.	Per cent.
Newcastle Emlyn	...	...	...	...	5 out of 21 = 23·8	2 or 9·5
Tregaron	...	...	...	...	8 " " 34 = 23·5	1 " 3·0
Llandyssul	...	...	...	...	8 " " 54 = 14·8	6 " 11·1
Plynlymon	...	...	...	...	3 " " 27 = 11·1	1 " 3·7
Newquay	...	...	...	...	8 " " 18 = 44·4	7 " 39·0

The importance of the "broad dark" element is therefore fairly marked, but the smallness of the numbers would prevent our emphasizing it if the case stood alone. Our general observation has, however, shown that a similar "coastal" nest of broad darks occurs on Pen Caer, a peninsula of fisherman-farmers west of Fishguard and Goodwick, and we shall find another patch of much greater size and importance on the Ardudwy coast. The discussion of its meaning and of possible correlations may be deferred till that is considered. The complete absence of the markedly narrow-headed dark men from our Newquay sample is noteworthy.

It may be mentioned that two other individuals were measured whose indices were in the neighbourhood of 84, but they are omitted as being outside our age limits of 19 and 65.

The contrast between these two small samples is a marked one, and in so far as it is not due to smallness of sample, and of course the sample taken at each place was, as usual, much larger than the list given, it is possible to suggest a few points for comparison. While at both places there are persons who would naturally be referred to the neolithic type, at Newcastle Emlyn there is a fairly marked "Scandinavian" element, and at Newquay there is a distinct strain of dark brachycephaly. In both cases we think the strain mentioned is characteristic of the locality and, at least not in any marked degree, of places near by.

TABLE 9.—NEWQUAY SAMPLE.

(The letters on the map, Fig. 1, are enclosed by a broken line.)

No.	Age.	Index.	Head length.	Head breadth.	Stature.	Map letter.
1	28	76·4	199	152	1725	<i>f</i>
2	20	76·4	204	156	1780	<i>f</i>
3	24	76·6	210	161	1715	F
4	50	76·7	193	148	1660	<i>F</i>
5	adult	76·8	203	156	1650	F
6	19	77·0	196	151	1620	<i>g</i>
7	30	77·0	200	154	1655	<i>g</i>
8	49	77·4	195	151	1635	<i>g</i>
9	20	78·3	194	152	1625	<i>h</i>
10	65	79·5	195	155	1660	<i>j</i>
11	19	80·0	190	152	1645	<i>k</i>
12	49	80·3	203	163	1780	<i>K</i>
13	52	80·8	203	164	1715	<i>k</i>
14	42	81·9	193	158	1685	<i>l</i>
15	23	82·7	185	153	1720	m
16	25	83·8	185	155	1675	<i>n</i>
17	30	85·0	186	158	1665	<i>p</i>
18	30	85·4	185	158	1730	<i>p</i>

TABLE 10.—NEWCASTLE EMLYN SAMPLE.

(The letters on the map, Fig. 1, are enclosed by a broken line.)

No.	Age.	Index.	Head length.	Head breadth.	Stature.	Map letter.
1	36	73·0	200	146	1680	<i>B</i>
2	48	73·7	205	151	1805	<i>B</i>
3	adult	73·6	201	148	1660	<i>b</i>
4	adult	74·7	198	148	1550	<i>x</i>
5	adult	74·9	195	146	1780	<i>D</i>
6	61	76·0	196	149	1640	F
7	61	76·3	198	151	1590	<i>F</i>
8	65	77·2	206	158	1780	G
9	30	77·3	211	163	1670	G

TABLE 10.—NEWCASTLE EMLYN SAMPLE—*continued.*

No.	Age.	Index.	Head length.	Head breadth.	Stature.	Map letter.
10	21	77·3	198	153	1770	G
11	58	77·5	209	162	1675	G
12	31	78·2	188	147	1705	h
13	49	78·9	189	149	1670	h
14	24	78·9	199	157	1560	H
15	59	79·0	205	162	1725	J
16	adult	79·8	203	162	1815	j
17	45	80·5	200	161	1745	K
18	adult	81·2	202	164	1700	L
19	20	82·1	190	156	1715	R
20	50	82·1	195	160	1675	m
21	28	83·6	189	158	1780	n

TABLE 11.—ADULT MEN WITH PART-ANCESTRY AT NEWCASTLE EMLYN.

No.	Age.	Index.	Head length.	Head breadth.	Stature.	Map letter.
1	36	74·8	210	157	1720	D
2	52	75·1	201	151	1775	E
3	36	76·8	191	147	1720	F
4	adult	77·3	193	149	1650	G
5	adult	77·8	185	144	1660	g
6	adult	78·2	193	151	1740	x
7	49	78·9	189	149	1670	h
8	28	79·9	199	159	1725	J
9	adult	80·8	193	156	1720	k
10	61	81·6	196	160	1665	L
11	28	81·9	183	150	1775	L

The Cardiganshire Map (Figs. 1 and 3-5).—General Analysis.

A cursory inspection of the Cardiganshire map reveals two facts :—

1. There are distinct centres with characteristic types.
2. There are more or less distinct regions, each with its own proportions of the various stocks.

The distinct centres are dealt with individually above ; they are enclosed in continuous lines on the map.

The regions which seem marked out most reasonably are as follows :—

- (a) North Cardiganshire, north of the Ystwyth and Wyre valleys (these form an almost straight line E.N.E.—W.S.W. on the map).
- (b) Mid Cardiganshire, which we shall take to be the region between the Wyre and the Ystwyth line on the north and the Aeron line farther south.
- (c) South Cardiganshire, including the Pembrokeshire and Carmarthenshire sides of the Teifi valley, and the country towards Mynydd Prescely in North Pembrokeshire.

The northern division includes mainly the Plynlymon moorland, together with the coastal plateau which forms its western edge. We have avoided getting measurements from Aberystwyth itself as that has been for centuries a centre of somewhat more than purely local consequence, though on a very small scale ; its population is therefore very mixed if one attempts to inquire far back.

The middle division includes a stretch of fairly low and generally approachable coast, this characteristic appearing suddenly just south of the Wyre boundary. Behind this coast is the moorland of Mynydd Bach, and behind this the swampy, central section of the Teifi basin.

South Cardiganshire is the moorland described in connection with Llandyssul, together with its fringing valleys leading down either to the sea or to the Aeron or Teifi.

The Teifi valley is quite narrow from Llandyssul westward to the sea, *i.e.*, the plateau edge comes very near to the river.

The following analysis for the three districts and the county summarizes the facts on the map :—

Ceph. index.	North section.	Middle section.	South section.	Totals.
	Dk. Hair. Lt. Dk. Eyes. Fair.	Dk. Hair. Lt. Dk. Eyes. Fair.	Dk. Hair. Lt. Dk. Eyes. Fair.	Dk. Hair. Lt. Dk. Eyes. Fair.
Under 73 ...	5 + 0 + 1	2 + 0 + 2	2 + 1 + 1	9 + 1 + 4
73 to 73·9 ...	4 + 3 + 0	1 + 1 + 2	4 + 4 + 0	9 + 8 + 2
74 to 74·9 ...	4 + 0 + 2	8 + 2 + 0	9 + 0 + 2	21 + 10 + 4
75 to 75·9 ...	5 + 3 + 2	12 + 4 + 3	13 + 11 + 1	30 + 18 + 6
76 to 76·9 ...	4 + 3 + 1	5 + 7 + 3	16 + 10 + 5	25 + 20 + 9
77 to 77·9 ...	6 + 6 + 2	5 + 7 + 7	12 + 8 + 8	23 + 21 + 17
78 to 78·9 ...	5 + 2 + 3	7 + 9 + 8	18 + 5 + 4	30 + 16 + 15
79 to 79·9 ...	8 + 7 + 1	5 + 7 + 11	9 + 8 + 4	22 + 22 + 16
80 to 80·9 ...	2 + 4 + 4	8 + 6 + 4	11 + 8 + 3	21 + 18 + 11
81 to 81·9 ...	2 + 1 + 1	6 + 1 + 2	6 + 3 + 2	14 + 5 + 5
82 to 82·9 ...	1 + 1 + 2	1 + 2 + 1	5 + 3 + 1	7 + 6 + 4
83 to 83·9 ...	2 + 1 + 1	0 + 1 + 2	3 + 1 + 1	5 + 3 + 4
84 and above	0 + 0 + 0	2 + 1 + 0	3 + 0 + 0	5 + 1 + 0
	48 + 31 + 20	62 + 48 + 45	111 + 70 + 32	221 + 149 + 97
Reds ...	11	16	14	41
x ...	4	7	10	21
	114	178	237	529

Note that the numbers for each index do not include the people with red hair nor the people with light hair and dark eyes (marked x on maps), both of these being given separately at the end of each list.

Comparing the proportions of dark dolichocephals (index below 79) in the three districts, we notice that they form 28·9 per cent. in the north, 22·5 per cent. in the centre, and 31·2 per cent. in the south. The two moorlands previously noticed seem to us to account for the higher percentages of north and south against the centre.

Comparing the proportions of fair men, we notice that the percentages are 17·5 in the north, 25·3 in the centre, and 13·5 in the south. This last low value would be much lower still were it not for the "nest" of fair people at Newcastle Emlyn.

The centre is thus noteworthy for its greater proportion of fair types and, looking at the table, we see that the distribution of cephalic index among them tails off on either side from a maximum between 77·0 and 79·9, *i.e.*, the range of variation suggests that we are dealing with one type which tends to dolichomesaticephaly, and this is the general impression one gets from a study of the fair type everywhere. The range of variation among the fair types in the south of the county bears this out, as does the analysis of the Newcastle Emlyn district.

Our suggestion is that the importance of this type (a widely known fact) in

the central section of the county is to be connected with the openness of the coast, and, for aught we know, perhaps with exchanges between this region and the Leinster coast opposite. To north and south, however, the moorland is more sharply marked and we get more definite and predominant occupation by the neolithic type. In the north, Aberystwyth forms almost the only reasonable entry from the sea. In the south the plateau comes so near to the sea edge along the coast and at the Teifi mouth that it does not suggest opportunities for easy penetration.

It should also be noted that the upper Ystwyth line has long been known as a copper region, and this may have drawn adventurers in times past from the sea to the open coast just south of the Ystwyth-Wyre line. An interesting series of earthworks defends the flanks of this line.

The somewhat persistent occurrence of two maxima among the dark dolichocephals, one about index 75 or 76 and one about 78 or 79, is noteworthy, as it is a general feature. There seems, indeed, very little doubt that among the dark dolichocephals we have several sub-types, as will be discussed in greater detail hereafter.

Reviewing the whole county, we note the following chief points discussed at greater length in the preceding pages :—

1. The importance of dark dolichocephals all over the county, but especially on and around the northern and southern plateaux.
2. The presence of various sub-types of the above (*e.g.*, around Plynllymon and around Llandyssul).
3. The importance of dark dolichocephals on the slopes of the south plateau.
4. The presence of "red nests" at Tregaron and on the Plynllymon moorland.
5. The importance of the fair type (mostly mesaticephalic) in the centre where the coast is open and low.
6. The surprising character of the sample from the district around the Teifi mouth. Here the fair type is a very small, even unusually small, proportion, and broad heads are also scarce, though they become commoner southward as one approaches Pencaer. We think that the near approach of the plateau edge to the river bank in this region helps to account for the character of this sample, which, on the whole, approaches that discussed for Llandyssul district sufficiently closely to corroborate the conclusions drawn from the study of that district, and not to need a similarly detailed analysis. The one difference here is the presence of larger numbers with dark hair and light eyes, in fact the number of these here exceeds the number with both these features dark, and this is of very exceptional occurrence.
7. The "fair nest" at Newcastle Emlyn. It would be unwise to insist on any hypothesis to account for this, but we may just note that it does not seem to us to be connected with the "fair" sprinkling of the centre of the county nor, specially, with the fair people so characteristic of South

Pembrokeshire. It is just possible that fair types penetrating up the Teifi estuary would be swamped by the plateau types farther down, the valley being so narrow, perhaps leaving the lightness of the eye as a trace of their passage. They might, however, maintain themselves more easily on the isolated and long-fortified hill of circumdenudation, on which Newcastle Emlyn is built. Influence of military garrisons, etc., could be suggested, but that type of influence seems weak in most cases and we are therefore chary of utilizing such hypotheses. The spread of Fleming influence from Pembrokeshire up to the centre of Cardiganshire is, however, a possibility (see p. 113).

8. The little "broad-dark" group at Newquay. It should be noted that we have avoided Aberayron, because it is a town of recent (eighteenth-century) growth.
9. The special character of the Plynllymon sample and the influence of that character on the types round about.

Cardiganshire was appropriate for detailed study, not only because it was our home county, but also because it is probably the county which is the least touched by recent alterations. It has now for a long time being sending out men, in fact they are beyond question its chief export.

MERIONETHSHIRE.

(See Tables 12 and 13, pp. 90-97, also Figs. 2 and 3-5.)

Comparing our map register of Merionethshire with that for Cardiganshire, we note some marked differences. (Figs. 2 and 3-5.) There are no well-marked nests of dark dolichocephals, nor is there a nest of reds, such as there is at Tregaron. A table herewith helps to make this clearer. The percentage number of dark dolichocephals of the more marked variety is given below for Merionethshire and for Cardiganshire and North Cardiganshire, classified under the map letters, but in the totals for Merionethshire are included several persons who could not be registered on the map because of ancestral links with too widely separated parts of the county.

Map letter.	North Cardiganshire.	Cardiganshire.	Merionethshire.
a or <i>a</i>	4·4 per cent.	1·7 per cent.	0·9 per cent.
b or <i>b</i>	3·5 "	1·7 "	0·6 "
d or <i>d</i>	3·5 "	4·0 "	3·0 "
e or <i>e</i>	4·4 "	5·7 "	5·2 "
Total	15·8 "	13·1 "	9·7 "
Number of cases	114	529	329

The high values for a and b in the case of North Cardiganshire are connected with the peculiarities of the Plynllymon moorland already noticed, but the ancient dark dolichocephalic type is much more marked throughout the county than it is in Merionethshire.

On the other hand, the percentage numbers of dark brachycephals in Merionethshire is considerably higher than in the other districts just named. A table classified under the map letters (*L-p*) will show this, and will show especially that the percentage of these types on the Ardudwy coast (Barmouth estuary northwards) is remarkably high.

Map letter.	North Cardiganshire.	Cardiganshire.	Merionethshire.	Ardudwy coast of Merionethshire including Valley of Ffestiniog.
l or <i>l</i>	1·8 per cent.	2·6 per cent.	4·0 per cent.	6·2 per cent.
m or <i>m</i>	0·9 "	1·3 "	3·0 "	5·3 "
n or <i>n</i>	1·8 "	0·9 "	1·2 "	1·8 "
p or <i>p</i>	0·0 "	0·9 "	2·1 "	5·3 "
Total	4·5 "	<i>Circa</i> 5·8 "	10·3 "	18·6 "
Number of cases	114	529	329	113

The coast of Northern Merionethshire may thus be considered a centre of "broad darks," and may be compared with the little nest of these types at Newquay, Cardiganshire, while the whole county stands contrasted with Cardiganshire as regards the proportion of dark dolichocephals (of marked type).

Having found a geographical hypothesis useful in understanding our Cardiganshire figures, let us examine the case of Merionethshire.

In this county, save behind the coast near Harlech, there is little of that open moorland country, at reasonable elevation but above the primitively forested or swampy valleys, which seems to have been the natural location for neolithic man.

In Merionethshire, for the most part, the deep-cut valleys have rugged sides rising sharply to the rocky mountain crags. The open country, under primeval conditions, must have been not only very high and rock-strewn, but also cold, away from the sea. It thus bears out our working hypothesis when we find that the neolithic (Mediterranean) type is not by any means so conspicuous in Merionethshire as in Cardiganshire. The general ruggedness of some of these great valleys leaves one in doubt as to whether they were afforested, but, even if they were not, they would be lines of passage rather than of settlement.

The "open country" behind Harlech fronts the coast, and may be compared with that of South Cardiganshire. In both cases (Newquay district and this Ardudwy coast) we find the dark brachycephals as a conspicuous element. In the

case of South Cardiganshire, however, there is a large extent of open country, and it ultimately breaks down into a fair valley landwards, and in that valley (Llandyssul and Llanybyther) the dark dolichocephals are dominant. In Merionethshire, on the other hand, the open country of this type is limited and goes back landwards into rocky mountain country (Rhinog).

We therefore suggest that the early population of Merionethshire was a very limited one, and that the county was first effectually occupied at a later stage than Cardiganshire. Certain types markedly contrasted with the chief ones of Cardiganshire are characteristic, and our hypothesis is that they are descendants of immigrants or invaders later than the fundamental and supposedly neolithic type. Our view would be, that while such types may have spread in both counties, they have persisted better where their inheritance could not be washed out by a strong indigenous strain such as was present in Cardiganshire.

If we study the map-registers for the great valleys of Merionethshire, the great fault valley through Bala, Llanuwchllyn, Talyllyn, and Towyn, with its branch valley through Dolgelly, and the side valley up to Trawsfynydd, we notice a few peculiarities.

1. Twenty-six of the 138 men registered have noses of markedly convex outline, sometimes almost regularly curved, sometimes more or less angulated; these are currently known as Roman noses and can also be compared with those on the profiles in bas-relief found among the ruins of the Hittite cities.

2. The men showing this character are represented by the following letters:—

F f G G G H H H h h J J j j K K k k L L M m m r R

Of these 26, 10 therefore are dark-haired with light eyes, 5 are fair. None of them belong to the extreme dolichocephals, and those with index 80 or above are about thirty-five per cent. of the sample. Outside this region the number of people with dark (including medium brown) hair and light eyes in the two counties chosen is practically never as high as that of more completely dark people, while here it is 52 against 50, and for the "Roman-nosed" people the numbers are 10 and 9.

3. Among the men registered for Llanuwchllyn, Bala, etc., numbering 69, no less than 26 are distinctly tall. Their register letters are:—

D D D E E E e F F f f G H H H H H J j k L l m m N

It will thence be noted that the dolichocephalic side is well represented amongst these tall people, and that dark colouring is not very common amongst them, at least as regards their eyes.

4. Among the same 69 men, 22 are short. Their register letters are:—

A b D d e e f F G G H j j j J k k K K l m p

There are thus 13 dark people among the 22 as against 7 among the 26. We may point out that these proportions of tall and short are very unusual in Wales.

Those are called tall whose height is above 1750 mm. (nearly 5 feet 9 inches), and they are distinctly few elsewhere in our two counties, as the accompanying tables show. Those are called short whose stature is less than 1675 mm. (about 5 feet 6 inches).

It is to be noted in the table that the only other district which shows a considerable frequency of tallness is that of Newcastle Emlyn, where, as has been said, the tall fair Nordic type occurs.

District.	Tall.	Short.	Number of cases.
Tregaron, etc.	23·5 per cent.	23·5 per cent. ¹	34
Newquay	11·1 „	50·0 „	18
Newcastle Emlyn, etc. ...	28·6 „	33·3 „	21
Llandyssul, etc.	13·8 „	39·7 „	58
Denbigh moorland	19·6 „	47·0 „	51
Bala, Llanuwchllyn	37·7 „	31·9 „	69

We thus identify a tall type as being characteristic of this cleft: it is not distinctly dark; in fact, in most of the places named, dark colouring most often goes with short stature. For all that, it cannot be identified as fair, nor can it be identified completely with the Roman-nosed type.

The most marked types issuing from this region are perhaps the fair, medium to broad-headed men with "Roman" noses, and usually a well-marked brow ridge. They are sufficiently distinct to be recognized by other Welshmen as belonging to this district, and hardly any other district is known to show them in any numbers. They represent, at any rate, an aggregation of those characters which are notably distinctive of the district (Plate III, 2A, 2B; Plate IV, 2).

It will be useful to give a detailed list of observations in one typical case:—

Skin fresh, eye light grey, hair light brown, slightly on the scarce side of medium as regards quantity. Face broad but not heavy jawed. Ear distinctly large. Head length (max. ant.-post. diameter) 201, max. breadth 164, bizygomatic breadth 140, bigonal breadth (angles of lower jaw) 116, auriculo-nasal radius 88, auriculo-alveolar radius 84, head circumference 583, stature 1770 mm. Length of arm (to tip of middle finger) 775 mm. Length of leg 917 mm. Cephalic index 81·6. The height of the head was notable, though we did not take it as we find this an unsatisfactory measurement on living heads under our conditions of work.

¹ Three other men in our table all have this measurement exactly on the 1675 limit, so this figure should really be higher in order to give a true idea of the population.

As regards dimensions of the head, this gentleman is above the normal, the length and breadth respectively being more often in the neighbourhood of 190 and 155.

It is difficult to make useful comparisons between modern heads and prehistoric crania, but it may not be amiss to note that the Cowlam skull¹, though rather shorter and broader, may not have been unlike this type in general character. It is markedly distinct from those brachycephalic skulls, bearing every mark of savagery, which have been considered too often to be the one and only "Bronze Age Type." That term is fortunately giving place to the term, "Type of the Beaker Makers." It is permissible to suppose that the course of life in 4000 years has softened these rugged features and that our type is descended fairly directly from that one.

The rugged-browed platycephalic type is not one which we have found among our brachycephalic people, but strength of brow, large size of skull and brachycephaly associated with the strong development of the nose above mentioned and with tall stature are certainly characteristic of Merionethshire, and especially of the great cleft which reaches the sea at Towyn.

We incline to look upon these brachycephals as, then, in some degree analogous with, and hence possibly related to, some of the types known as the Bronze Age invaders of Britain, the types which Abercromby² associates with his "Bronze Age Pottery." It would be better to refer to Beakers, and not to use the term Bronze Age, as it is increasingly believed that these people were not the bringers of Bronze.³

Abercromby shows that his potters occupied chiefly open country, but we note for future reference that they did not make much impression in Cornwall. Abercromby supposes that this was because of extreme wetness of the climate, but we shall later on draw attention to another hypothesis, noting meanwhile that he allows Cornwall to have been touched after 1500 B.C. (his date for the ultimate fusion of his potters with the indigenous population) by invaders, who made broad-handled pottery of Armorican type.

It has already been shown that the proportion of dark brachycephals is unusually high in the Ardudwy region, in which we include the coast between the Mawddach estuary and Criccieth, and into which we incorporate the vale of Ffestiniog, though we do this last with misgivings, and only because we find it difficult to fix a dividing line otherwise.

In this region we have 113 registers on our map, and these can be classed as follows:—

¹ Greenwell and Rolleston, *British Barrows*, 1877, p. 587.

² Abercromby, J., *Bronze Age Pottery*, 1912, pp. 64, 110, etc.

³ It must be remembered that men of this type may have been present, especially perhaps among the leaders, in immigrant groups subsequent to the group discussed by Abercromby. This point is sometimes overlooked in discussions of this, and of other, types.

	Letter.	Dark hair, and eyes.	Dark hair, light eyes.	Light hair and eyes.
Cephalic index under 73 ...	a	1	0	0
73—73·9 ...	b	0	1	1
74—74·9 ...	d	2	3	0
75—75·9 ...	e	7	2	2
76—76·9 ...	f	4	1	1
77—77·9 ...	g	10	2	3
78—78·9 ...	h	4	4	1
79—79·9 ...	j	8	4	0
80—80·9 ...	k	2	6	7
81—81·9 ...	l	7	2	0
82—82·9 ...	m	6	2	0
83—83·9 ...	n	2	3	3
84 and above...	p	6	1	0

Also two red-haired men with indices below 79 and two with indices above 80, and one man with the anomalous combination of dark eyes and light hair.

With the broad darks forming 18·6 per cent. of the sample (index 81 and above), and the narrow darks (under 76·0) only 8·8 per cent. (15·8 per cent. in North Cardiganshire; 13·0 per cent. in Cardiganshire generally), the character of the population is seen to be definitely marked. Fair types are scarce as well.

We have already noticed the same fact of preponderance of broad darks, on a small scale, at Newquay on the Cardiganshire map. Our general observations have shown us that it is characteristic of the Pencaer district of North Pembrokeshire, and we shall find other examples of this elsewhere. Now in each of these three cases we are dealing with places on the coastal fringe of a moorland which was almost certainly open country in prehistoric times. There would thus seem to be something supplementary to be added to our general statement about such open country and its population.

If the dark dolichocephals were found here in anything like the proportion in which they occur around the moorlands a little way in from the coast (see analyses of Llandyssul table) we should be inclined to wonder whether our broad darks were not merely the broader variants of the ordinary dark type of dolichocephal, but our distributional study seems to point to their being a distinct type. They are distinct also in that their frames are more stalwart; their stature, while very variable, is occasionally quite tall. It might be suggested that they are a variant which has arisen after the fashion in which Boas supposes types to change, but, in our general conclusions, we think it will be possible to offer an alternative hypothesis for the consideration of archaeologists and anthropologists. Briefly, we think we have here traces of settlements of coastal wanderers, and we propose to examine and develop this view after considering other regions.

A few words should be added concerning the sample from the vale of Ffesti-niog. Here, owing to movements in recent years in connection with the slate quarries, it is not possible to be quite sure of the indigenous character of the sample, but we note that of the 28 people entered on the map, 13 are dark dolichocephals, a considerable proportion. There are 5 distinctly brachycephalic people (index 81 or over), and the district shows no fair types with index below 80. The district shows a characteristic "Neolithic" element appropriate near the moorlands to the north, and also appropriate to a more or less industrialized place, for this is the type which seems to resist the dangers of industrialism most effectively. Mixed with this is the brachycephalic element so characteristic of the remainder of the county. A noteworthy feature is that not one of our 27 is tall, while 16 of the 27 are distinctly short.

This feature is generally known, and it is stated in the district that the bones of the people are small and set only with difficulty after a breakage. This is locally ascribed either to the extraordinary rainfall or to the absence of lime in this slaty district with water probably containing humic acids. We cannot do more at present than note these suggestions without comment, save that we think the industrialization of the district and its present poverty are cardinal facts.

TABLE 12.—THE GREAT CLEFT AND ITS BRANCHES.

Clarendon type = convex nose profile.

NOTE.—Clarendon type is used, for convenience of printing, in place of the underlining employed on the map of Merionethshire (Fig. 2, *q.v.*).

Number and region.	Cephalic index.	Head length.	Head breadth.	Stature.	Map letter.	Age.
1. Llandrillo	72·2	198	143	1645	<i>A</i>	62
2. Towyn	72·8	206	150	1735	<i>a</i>	adult
3. Bala and Cynwyd	73·0	199	146	1740	<i>b</i>	28
4. Dolgelly	73·1	193	141	1615	<i>B</i>	31
5. Talylyn	73·1	201	147	1705	<i>B</i>	63
6. Bala and Llanuwchllyn	73·8	187	138	1620	<i>b</i>	63
7. Bala	74·0	192	142	1600	<i>d</i>	42
8. Dolgelly and Trawsfynydd	74·1	201	149	1745	<i>d</i>	adult
9. Bala and Cerrig-y-druidion	74·5	200	149	1830	<i>D</i>	40
10. Bala and Llanuwchllyn	74·5	200	149	1805	<i>D</i>	41
11. Corwen and Llandrillo	74·5	192	143	1805	<i>D</i>	33
12. Towyn	74·6	197	147	1730	<i>D</i>	adult
13. Towyn	74·7	202	151	1690	<i>r</i>	53
14. Bala and Llanuwchllyn	74·8	195	146	1640	<i>D</i>	22
15. Dolgelly	74·9	193	143	1675	<i>d</i>	20

TABLE 12.—THE GREAT CLEFT AND ITS BRANCHES—*continued*.

Number and region.	Cephalic index.	Head length.	Head breadth.	Stature.	Map letter.	Age.
16. Dolgelly	75·0	200	151	1780	E	20
17. Dolgelly	75·1	193	145	1555	<i>x</i>	32
18. Arthog and Cleft	75·3	203	153	1905	<i>E</i>	adult
19. Dolgelly	75·5	192	145	1605	<i>E</i>	60
20. Towyn and coast	75·5	200	151	1780	<i>E</i>	20
21. Bala	75·5	212	160	1830	E	58
22. Bala	75·6	193	146	1500	e	25
23. Bala	75·6	197	149	1880	<i>E</i>	47
24. Cynwyd, etc.	75·6	201	152	1740	<i>e</i>	28
25. Cynwyd, etc.	75·6	197	149	1600	<i>e</i>	adult
26. Dolgelly	75·7	206	156	1695	<i>e</i>	55
27. Dolgelly	75·8	203	154	1665	e	52
28. Dolgelly and Bala	75·8	207	157	1760	<i>e</i>	46
29. Llanuwchllyn	75·8	203	154	1785	<i>E</i>	45
30. Bala	75·9	195	148	1680	<i>E</i>	36
31. Bala	76·0	200	152	1720	<i>F</i>	21
32. Dolgelly	76·0	200	152	1665	F	adult
33. Aberdyfi, etc.	76·1	192	146	1645	<i>f</i>	39
34. Dolgelly and Bala	76·3	198	151	1680	F	33
35. Llanuwchllyn	76·3	198	151	1755	<i>f</i>	adult
36. Dolgelly	76·3	198	151	1600	F	26
37. Dolgelly and Bala	76·4	195	149	1825	<i>F</i>	24
38. Dolgelly	76·4	203	155	1835	F	34
39. Llanuwchllyn	76·4	191	146	1600	<i>F</i>	37
40. Bryncreg	76·4	199	152	1620	<i>F</i>	44
41. Towyn	76·5	200	153	1570	<i>F</i>	57
42. Bala	76·5	183	140	1740	<i>f</i>	40
43. Bala and Cerrig-y-druidion	76·5	200	153	1670	<i>f</i>	20
44. Upper Mawddach	76·5	179	137	1650	<i>F</i>	58
45. Dee Valley	76·5	196	150	1675	<i>x</i>	42
46. Towyn	76·6	192	147	1570	<i>r</i>	60
47. Dolgelly	76·6	192	147	1610	<i>r</i>	22
48. Dolgelly	76·6	184	141	1655	<i>F</i>	adult
49. Llanuwchllyn	76·7	197	151	1780	F	22
50. Towyn	76·7	193	148	1655	F	49
51. Aberdyfi, etc.	76·8	190	146	1640	f	adult
52. Bala	76·8	207	159	1775	<i>f</i>	35
53. Towyn	76·8	198	152	1710	<i>f</i>	34
54. Bala and Dolgelly	76·9	199	153	1710	<i>f</i>	40

TABLE 12.—THE GREAT CLEFT AND ITS BRANCHES—*continued.*

Number and region.	Cephalic index.	Head length.	Head breadth.	Stature.	Map letter.	Age.
55. Bala	77·2	193	149	1710	<i>G</i>	21
56. Upper Mawddach	77·2	197	152	1725	<i>g</i>	adult
57. Bala and Llanuwchllyn	77·3	189	146	1605	G	54
58. Talyllyn	77·3	194	150	1690	G	52
59. Bala and Cerrig-y-druidion	77·6	187	145	1615	G	20
60. Bala	77·7	193	150	1750	<i>G</i>	28
61. Towyn	77·8	194	151	1645	G	54
62. Dolgelly	77·8	194	151	1685	<i>g</i>	56
63. Dolgelly	77·9	190	148	1635	<i>G</i>	29
64. Towyn	77·9	199	154	1700	<i>G</i>	44
65. Dolgelly	77·9	195	152	1670	<i>G</i>	42
66. Llanegryn	78·0	200	156	1790	<i>H</i>	adult
67. Llanuwchllyn	78·2	188	147	1600	H	43
68. Dolgelly	78·2	193	151	1675	h	adult
69. Bala, etc.	78·3	203	159	1695	H	33
70. Bala	78·4	204	160	1790	<i>H</i>	52
71. Aberdyfi and Towyn	78·4	208	163	1750	h	adult
72. Bala	78·5	200	157	1750	<i>H</i>	50
73. Llanuwchllyn	78·5	186	146	1785	H	32
74. Towyn and Dolgelly	78·5	191	150	1590	<i>H</i>	52
75. Llanuwchllyn and Bala	78·6	192	151	1780	<i>H</i>	45
76. Bala	78·6	201	158	1785	<i>H</i>	48
77. Towyn	78·6	196	154	1705	<i>h</i>	30
78. Dolgelly	78·6	196	154	1725	<i>h</i>	adult
79. Dolgelly	78·8	193	152	1620	<i>h</i>	49
80. Corwen	78·8	194	153	1725	<i>H</i>	45
81. Towyn	78·8	193	152	1675	<i>H</i>	19
82. Bala	78·9	189	149	1645	<i>h</i>	52
83. Dolgelly, etc.	78·9	185	146	1770	<i>H</i>	21
84. Bala and Corwen	79·1	201	159	1800	J	adult
85. Bala, etc.	79·2	187	148	1805	<i>J</i>	20
86. Bala and Corwen	79·3	188	149	1675	<i>J</i>	24
87. Bala, etc.	79·3	184	146	1605	J	64
88. Dolgelly, Corris	79·3	184	146	1695	J	adult
89. Towyn, etc.	79·3	193	153	1635	<i>j</i>	21
90. Dolgelly, etc.	79·3	193	153	1705	<i>J</i>	57
91. Upper Mawddach	79·4	189	150	1550	<i>j</i>	25
92. Talyllyn	79·4	189	150	1525	<i>J</i>	22
93. Bala, etc.	79·4	184	146	1610	j	29

TABLE 12.—THE GREAT CLEFT AND ITS BRANCHES—*continued.*

Number and region.	Cephalic index.	Head length.	Head breadth.	Stature.	Map letter.	Age.
94. Bala	79·5	185	147	1740	<i>J</i>	19
95. Dolgelly	79·6	186	148	1725	<i>J</i>	34
96. Dolgelly and Bala	79·6	186	148	1665	<i>j</i>	22
97. Dolgelly	79·7	187	149	1695	<i>J</i>	adult
98. Bala and Corwen... ..	79·7	182	145	1655	<i>J</i>	23
99. Dolgelly	79·8	188	150	1690	<i>j</i>	20
100. Trawsfynydd	79·8	198	158	1690	<i>J</i>	adult
101. Towyn	79·8	191	152	1610	<i>J</i>	40
102. Towyn, etc.	79·9	199	159	1770	R	44
103. Bala, etc.	80·1	186	149	not taken	<i>k</i>	19
104. Towyn, etc.	80·1	196	157	1790	<i>k</i>	adult
105. Dolgelly, Bala	80·1	191	153	1590	K	62
106. Dolgelly	80·1	186	149	1710	<i>k</i>	34
107. Bala	80·3	183	147	1630	k	26
108. Towyn	80·3	198	159	1655	K	adult
109. Llanuwchllyn	80·3	188	151	1580	K	42
110. Trawsfynydd	80·4	184	148	1630	K	54
111. Dolgelly, Bala	80·4	189	152	1670	<i>k</i>	27
112. Towyn	80·5	195	157	1575	<i>K</i>	56
113. Dolgelly	80·6	191	154	1820	R	21
114. Llanuwchllyn	80·7	192	155	1865	k	55
115. Bala	80·9	183	148	1670	K	52
116. Bala	81·1	191	155	1775	<i>l</i>	43
117. Towyn	81·2	192	156	1685	<i>L</i>	39
118. Bala	81·3	182	148	1680	L	58
119. Aberdovey	81·4	188	153	1700	L	adult
120. Llanuwchllyn	81·4	189	154	1675	<i>l</i>	29
121. Dolgelly	81·5	184	150	1650	L	42
122. Dolgelly and Llanuwchllyn	81·6	201	164	1770	L	40
123. Aberdovey	81·6	196	160	1630	<i>L</i>	adult
124. Bala	81·6	185	151	1640	<i>l</i>	49
125. Bala, etc.	81·9	193	158	1710	<i>l</i>	35
126. Dolgelly and Corris	82·0	189	155	1680	M	43
127. Bala	82·1	179	147	1625	<i>m</i>	49
128. Bala	82·1	190	156	1810	m	56
129. Aberdovey	82·2	202	166	1490	<i>M</i>	adult
130. Dolgelly and Bala	82·3	181	149	1680	m	47
131. Bala and Corwen... ..	82·3	187	154	1655	M	22

TABLE 12.—THE GREAT CLEFT AND ITS BRANCHES—*continued*.

Number and region.	Cephalic index.	Head length.	Head breadth.	Stature.	Map letter.	Age.
132. Bala	82·3	204	168	1775	<i>m</i>	38
133. Dolgelly and Machynlleth ...	82·4	176	145	1655	<i>M</i>	adult
134. Trawsfynydd	82·9	193	160	1560	<i>M</i>	adult
135. Dolgelly	83·2	190	158	1660	<i>n</i>	56
136. Llanuwchllyn	83·5	188	157	1760	<i>N</i>	21
137. Bala	84·7	203	172	1670	<i>p</i>	55
138. Dolgelly and Llanuwchllyn ...	84·9	185	157	1675	<i>P</i>	23

TABLE 13.—ARDUDWY, ETC.

Those from Vale of Ffestiniog marked *

Clarendon type = convex nose-profile.

No.	Cephalic index.	Head length.	Head breadth.	Stature.	Map letter.	Age.
1	72·9	199	145	1720	<i>a</i>	21
2	73·6	197	145	1690	<i>B</i>	28
3	73·9	203	150	1670	<i>B</i>	adult
4	74·1	201	149	1720	<i>D</i>	adult
5	74·3	202	150	1630	<i>d</i>	36
6	74·4	195	145	1730	<i>D</i> *	adult
7	74·5	204	152	1720	<i>D</i>	adult
8	74·9	207	155	1670	<i>d</i> *	adult
9	75·1	193	145	1650	<i>e</i>	25
10	75·4	199	150	1645	<i>e</i>	adult
11	75·4	187	141	1655	<i>e</i> *	35
12	75·6	197	149	1700	<i>e</i>	adult
13	75·6	205	155	1720	<i>e</i>	adult
14	75·7	193	146	1630	<i>e</i> *	19
15	75·7	193	146	1650	<i>E</i>	30
16	75·7	193	146	1640	<i>E</i>	22
17	75·7	193	146	1690	<i>E</i>	adult
18	75·9	195	148	1730	<i>e</i>	adult
19	75·9	195	148	1660	<i>E</i> *	60
20	76·1	197	150	1675	<i>f</i> *	45
21	76·1	194	149	1670	<i>f</i>	adult
22	76·1	197	150	1735	<i>r</i> *	26

TABLE 13.—ARDUDWY, ETC.—*continued.*

No.	Cephalic index.	Head length.	Head breadth.	Stature.	Map letter.	Age.
23	76·2	193	147	1670	F	21
24	76·5	196	150	1655	<i>F</i>	adult
25	76·7	189	145	1630	f*	33
26	76·7	197	151	1720	r	42
27	76·9	195	150	1715	f	25
28	77·1	188	145	1630	G	40
29	77·2	197	152	1730	g	22
30	77·2	193	149	1635	g	46
31	77·2	193	149	1600	g*	adult
32	77·3	198	153	1680	G	24
33	77·3	198	153	1695	g	21
34	77·4	199	154	1640	G	adult
35	77·4	190	147	1630	g*	25
36	77·5	196	152	1690	g *	adult
37	77·6	187	145	1610	G*	adult
38	77·7	197	153	1700	G	65
39	77·7	188	146	1640	g *	63
40	77·8	194	151	1660	g*	26
41	77·8	194	151	1795	g	46
42	77·8	194	151	1700	g	adult
43	78·0	191	149	1670	H	adult
44	78·0	196	153	1645	H	58
45	78·0	200	156	1765	H	adult
46	78·1	206	161	1675	h	26
47	78·1	192	150	1635	h	37
48	78·2	197	154	1695	H	56
49	78·3	198	155	1680	h*	40
50	78·7	188	148	1670	H*	50
51	78·9	204	161	1720	h	21
52	79·2	188	149	1675	J	40
53	79·3	193	153	1745	j	34
54	79·3	193	153	1660	j	adult
55	79·4	194	154	1665	J	22
56	79·5	190	151	1655	j*	40
57	79·5	195	155	1655	j*	35
58	79·6	191	152	1675	J	adult
59	79·6	196	156	1590	j	42
60	79·6	191	152	1720	j	adult
61	79·7	192	153	1710	J	adult
62	79·7	197	157	1795	j	22

TABLE 13—ARDUDWY, ETC.—*continued.*

No.	Cephalic index.	Head length.	Head breadth.	Stature.	Map letter.	Age.
63	79.7	192	153	1630	j*	59
64	80.0	190	152	1620	K	22
65	80.0	185	148	1725	k	34
66	80.1	191	153	1560	K	adult
67	80.1	191	153	1595	K	adult
68	80.2	187	150	1710	K*	adult
69	80.2	187	150	1530	K	45
70	80.3	193	155	1760	K	adult
71	80.4	184	148	1670	K*	27
72	80.4	199	160	1640	K*	adult
73	80.5	195	157	1660	k	31
74	80.6	186	150	1695	x*	24
75	80.6	191	154	1590	K	40
76	80.8	187	151	1650	K	26
77	80.8	198	160	1685	K*	36
78	80.9	183	148	1700	K	30
79	80.9	189	153	1760	K	20
80	81.0	190	154	1715	l	33
81	81.0	195	158	1640	l	adult
82	81.1	191	155	1620	L	40
83	81.3	187	152	1710	l	30
84	81.4	193	157	not taken	l	adult
85	81.4	189	154	1680	R	adult
86	81.4	177	144	1565	l*	49
87	81.6	191	156	1680	l	adult
88	81.6	196	160	1690	l	28
89	81.9	194	159	1775	L	38
90	82.0	189	156	1765	m	19
91	82.1	196	161	1725	m	adult
92	82.3	186	153	1620	R	adult
93	82.7	185	153	1650	M*	adult
94	82.7	191	158	1645	m	33
95	82.7	191	158	1705	m	19
96	82.7	191	158	1620	m	adult
97	82.8	174	144	1690	M	24
98	82.9	181	150	1665	m	21
99	83.1	189	157	1645	N	36
100	83.3	192	160	1730	N*	55
101	83.3	198	165	1680	N	adult
102	83.3	192	161	1610	N*	65

TABLE 13.—ARDUDWY, ETC.—*continued.*

No.	Cephalic index.	Head length.	Head breadth.	Stature.	Map letter.	Age.
103	83·6	195	163	1680	N	26
104	83·6	183	153	1570	n	adult
105	83·9	199	167	1660	<i>n</i>	51
106	83·9	186	156	1705	<i>N</i>	45
107	84·0	188	158	1680	<i>p</i>	adult
108	84·0	187	157	1665	<i>p</i>	adult
109	84·1	189	159	1730	p	adult
110	84·6	188	159	1705	p*	19
111	85·1	188	160	1655	<i>p</i>	62
112	85·3	184	157	1645	p	50
113	85·8	190	163	1640	<i>P</i>	adult

MERIONETHSHIRE.

The table for Merionethshire as a whole does not call for comment beyond that which it has received above, but its numbers will be found useful for comparison with those given for Cardiganshire. In order to get as large numbers as possible we have included, not only those registered on the map, but also others whose ancestry connected them with parts of the county too widely separated to permit of our fixing on one place on the map for registration.

Cephalic index.	Map letter.	Black hair, brown eyes.	Dark or medium brown hair, brown eyes.	Dark or medium brown hair, light eyes.	Fair.	Red.	Light hair, dark eyes.	Total.
Under 73 ...	a	2	1	2	0	0	0	5
73 to 73·9 ...	b	0	2	3	2	0	0	7
74 to 74·9 ...	d	3	7	6	5	1	0	22
75 to 75·9 ...	e	5	12	12	6	0	1	36
76 to 76·9 ...	f	4	12	14	8	4	2	44
77 to 77·9 ...	g	6	10	12	5	0	0	33
78 to 78·9 ...	h	0	12	17	6	0	0	35
79 to 79·9 ...	j	7	12	19	6	1	0	45
80 to 80·9 ...	k	3	7	13	10	3	2	38
81 to 81·9 ...	l	4	9	5	4	1	0	23
82 to 82·9 ...	m	3	7	5	3	1	0	19
83 to 83·9 ...	n	1	3	6	3	0	0	13
84 and above	p	2	5	2	0	0	0	9
		40	99	116	58	11	5	329

NOTES ON OTHER SAMPLES FROM NORTH WALES.

I.—From Carnarvon and Anglesey we have up to the present only about seventy-two cards, and, scattered over such an area, they allow us little opportunity for drawing conclusions. This area seemed to us to be unsuitable for a first study, because its stirring history must have implied much intermixture at times remote beyond all chance of tracing out. Anglesey has been a sacred centre, has been the goal of metal-seekers, and has suffered much from sea-raiders. Carnarvon and Conway at once suggest interferences from without, and Carnarvonshire is largely composed of passes through the mountains. Though Carnarvonshire has been the great refuge, it has not that (human) isolation which is so characteristic of Merionethshire and Cardiganshire.

We note, however, a few points without wishing to emphasize them :—

1. The more marked forms of dolichocephaly do not occur among our sample and have not been noticed by us in the population.
2. The fairly average Mediterranean type is reasonably abundant and generally distributed, as our cards show. Direct observation seems to indicate the importance of Nevin as a centre for this type.
3. The pure dark types do not seem to be common in Anglesey. This is what one would expect from a consideration of the ways in which Anglesey must have been affected from the sea and by East Ireland, etc.
4. There appears to be a moderate sprinkling of quite broad heads, frequently accompanied by dark hair, in the district south of Carnarvon (*i.e.* Clynnog, Llanllyfni, etc.) and in Anglesey. (*Cf.* Ardudwy Coast, Newquay, Pencaer Pem., Llantwit Major, and so on.) In Anglesey, and perhaps elsewhere, the broad-headed dark type has a variety with long face and pointed chin.
5. There is somewhat more than the usual proportion of red hair in the county. No red-haired person measured here has an index below 75, and the maximum number of reds, as of fair types, falls between the indices 77 and 79 or 80.

II.—The northern part of the English border is another district which we have not worked in detail at this stage of our research, for here again was bound to occur intimate admixture of old standing and great complexity. We happen to have, nevertheless, about twenty-one cards for people from various parts of the fall line which runs from the Irish Sea coast of Flintshire to the emergence of the Dee from its deep valley on to the plain. A point of some interest is noticeable among these few cards. There are six of the twenty-one who have decidedly broad heads (index 81 or above), and they come one and all from the region where the Dee emerges. Two of them are fair but short, three are dark (two short and one tall), one is short and has dark hair and light eyes. As we have already drawn attention to the importance of broad heads in the great Merionethshire cleft, we have thought this worth noting for future inquiry. None of these broad heads

has the straight nose ; it is usually broad, and in two at least prominent and convexly curved or angulated. The notes given under this heading are naturally not of great consequence, but may be of use in the future, and in the meantime the cards are being preserved (see also below, p. 106). We think there is a strong element of the Mediterranean stock in the hill population of Flint, as in that of Denbigh (see above, pp. 67-69).

WESTERN MONTGOMERYSHIRE.

(See Table 14, p. 102, also Figs. 3-5.)

The county of Montgomeryshire is essentially the upper portion of the Severn System, and as such it is fairly open eastwards—*i.e.*, towards the English plain. The openings in this direction, as present circumstances go, are four in number. There is the way of the Severn itself, past Llan-y-mynech—a good line of railway connection, but one which was very swampy, no doubt, in former times. The way of Westbury is also used by the railway, but was difficult in earlier times, because the narrow valley is so dominated by the Breidden Hills and the Long Mountain, its fortified flanking hills. The Minsterley Valley is very swampy. The Montgomery, Bishop's Castle, Ludlow route for modern purposes has the disadvantage of a considerable rise, but this makes it dry, and in the Middle Ages it was without doubt an all-important route, as the town names just mentioned testify.

If we go back beyond the days of valley connections we find that, whereas the forest and swamp of the Dee basin on the north, and that of the lower Severn basin on the south, must have been important barriers, the Longmynd, Long Mountain, Caer Caradoc, Wenlock Edge, the Brown Clee Hills, etc., made a line of partially open country which probably permitted connection between the Birmingham plateau and Cannock Chase and what is now Montgomeryshire. Montgomeryshire has thus at all times been peculiarly open to penetration from the east, peaceful penetration as well as armed invasion.

Westward and north-westward in the county we get up among the feeders of the Severn that run deep between the moorland hills of the spreading Welsh plateau. The Severn itself comes from Plynlymon past Llanidloes, while the Carno meets the Severn below Llanidloes at Caersws. At the back, therefore, is the Plynlymon country already discussed, while across the watershed at the source of the Carno we get into the torrent valleys that have made deep ravines in the edge of the great plateau ; this is the wild country of the Dyfi System. The authority of Montgomeryshire has spread from antiquity up and through the pass at the head of the Carno, and has controlled that pass right away down to the focus at its western end, the town of Machynlleth.

We have, therefore, on all grounds considered the Dyfi valley people along with those of the valleys of Severn and Carno as far down as Llanidloes and Caersws. We do this the more freely because the Dyfi estuary has probably not been a region of entry to any extent. It has such large stretches of bog and of

sand, and its northern shore is so difficult, that one cannot imagine it being used as the Teifi, for example, may have been.

The numbers of narrow-headed men is one of the first points to be noted.

The average cephalic index for the 100 cases is 77.1 as against 78.0 for 1850 Welshmen from all parts.

The number of people with index below 73 is 9—a remarkable figure—for this 9 per cent., while exceeded by the figure (14.8 per cent.) for the adjacent Plynlymon moorland and that (9.8 per cent.) for the Denbighshire upland, compares with the following :—

North Cardiganshire generally	...	...	...	5.3 per cent.
Central Cardiganshire	...	...	...	2.2 „
South Cardiganshire	...	...	...	1.7 „
Cardiganshire generally	...	...	...	2.6 „
The Cleft in Merionethshire	...	...	...	1.4 „
Ardudwy	...	...	...	0.9 „
Merionethshire generally	...	...	...	1.5 „

In the case of the district we are now considering it seems fairly evident that the importance of extreme dolichocephaly is associated with influences from the Plynlymon moorland, which has doubtless exported men gradually at most periods.

The persons with dark colouring and indices of 81.0 or above only number 2 amongst our 100. This percentage compares with the following :—

North Cardiganshire	...	...	...	4.5 per cent.
Cardiganshire	...	...	...	5.8 „
Merionethshire	...	...	...	10.3 „
Ardudwy	...	...	...	18.6 „

The “broad dark” type is thus conspicuously scarce here.

Broad heads generally are rather uncommon, 9 per cent. for this district, comparing with about 13.2 per cent. for Cardiganshire and 19.4 per cent. for Merionethshire.

More important still is the unusual scarcity of people with black hair and dark eyes : only 4 out of the 100 show this character. This compares with :—

Merionethshire	...	...	...	12.2 per cent.
Denbighshire upland	...	...	...	19.6 „
Cardiganshire	...	...	...	11.1 „
Wales generally	...	...	...	10.4 „

A supplementary fact here is that the people with dark hair and light eyes are almost as numerous as those with both eyes and hair brown or black. The numbers are 32 against 34 in 100. Compared with this we have the figures 28.1 per cent. against 41.8 per cent. in Cardiganshire and 35.2 per cent. against

42·2 per cent. in Merionethshire generally, 27·4 per cent. against 52·2 in Ardudwy and 37·7 per cent. against 36·2 per cent. in the great Merionethshire Cleft. Only the last-named district thus has more of the "dark and light" type, and that was found to be a district with a characteristic blond strain. We interpret the facts noticed at Llanidloes as pointing to the influence of the blond stock, which is extremely important and abundant near the English border. In fact, one's general impression from a study of Llanidloes men is that we have here a region where the "Mediterranean race" character is diluted with blond elements. This impression, gained independently from the cards and from direct observation, is very clear.

The red-haired people, standing at 8 per cent., do not call for special comment. This is slightly above the average, but we are near Plynlymon, which has been seen to be almost a nest of reds. The people with the anomalous combination of light hair and brown eyes are 7 among our 100. This is an unusually high figure, which probably points to much crossing.

Llanidloes is an old market town to which are brought the sheep from the moorlands round Plynlymon, and here, therefore, incoming influences belonging to the Severn have met the moorland influences, and we get the one type diluted by constant intermixture with the other.

It is noteworthy at the same time that the average stature for our 100 cases is about 1662 mm. and for the 39 cases in the Dyfi region 1655 mm. Both these figures are well under average (general average 1695–1700 mm.). Sixty of our 100, or 25 of the 39, are distinctly short (below 1675 mm.), while only 3 (none of them from the Dyfi region) are distinctly tall (above 1750 mm.).

Here again, as in the Ffestiniog region, we seem to have prevalent lowness of stature, much below that noted for the Llandyssul region, for example (approximately 1700 mm.), with 23 out of the 58 (39·7 per cent.) short and 8 (13·8 per cent.) tall. The Denbighshire upland, again, has an approximately average stature for the 50 samples we have taken, but among them 24 (*i.e.*, 48 per cent.) are short and 10 (*i.e.*, 20 per cent.) are tall. Of the 10 just mentioned 6 are dark and none of the other 4 is pure fair. This hints that there are tall, dark (mostly dolichocephalic) men in North Wales, a type well known from general observation, and one which our study of Western Montgomeryshire would show does not materially affect the population so far south.

We consider this tall, dark dolichocephal to be a type found in the ancient kingdom of Gwynedd (mainly Carnarvonshire, Merionethshire and Denbighshire), and think him rather distinct from the typical Mediterranean of South and West Wales, who is somewhat shorter.

The similarity between our Western Montgomeryshire region (and especially the Dyfi valley) and Ffestiniog and its vale in the matter of stature should be considered by those interested as possibly correlated with the heavy rainfall and the dire scarcity of lime in the two districts, as also with their hard conditions of life. One does see tall men at Machynlleth, but it will often be found that they or their recent ancestors are immigrants, often from Merionethshire.

ANALYSIS FOR WESTERN MONTGOMERYSHIRE.

Cephalic index.	Map letter.	Black hair, dark eyes.	Dark hair (not black), brown eyes.	Medium or dark hair, light eyes.	Fair.	Red.	Light hair, dark eyes.	Total.
Under 72 ...	a	1	1	0	1	0	0	3
72 ...	a	0	4	1	1	0	0	6
73 ...	b	1	1	1	0	1	0	4
74 ...	d	0	1	1	3	0	2	7
75 ...	e	0	1	3	3	2	0	9
76 ...	f	0	2	5	3	1	2	13
77 ...	g	2	6	5	0	0	2	15
78 ...	h	0	10	6	1	0	0	17
79 ...	j	0	2	5	5	1	1	14
80 ...	k	0	0	1	0	2	0	3
81 ...	l	0	0	2	1	1	0	4
82 ...	m	0	0	0	1	0	0	1
83 ...	n	0	2	1	0	0	0	3
84 and over	p	0	0	1	0	0	0	1
	Totals ...	4	30	32	19	8	7	100

TABLE 14.—WESTERN MONTGOMERYSHIRE.

Those who belong to the mountain district or to the Dyfi valley are marked by an asterisk.

No.	Cephalic index.	Head length.	Head breadth.	Stature.	Map letter.	Age.
1	67·0	194	130	1600	a*	adult
2	70·7	205	145	1675	a	27
3	70·7	189	134	1620	A	24
4	72·3	199	144	1605	a	adult
5	72·3	195	141	1735	A	20
6	72·4	196	142	1785	a	adult
7	72·8	202	147	1645	a	adult
8	72·9	196	143	1665	A	31
9	72·9	188	137	1695	a*	adult
10	73·0	204	149	1710	r*	56
11	73·1	201	147	1655	B	33
12	73·8	191	141	1670	b*	30

TABLE 14.—WESTERN MONTGOMERYSHIRE—*continued.*

No.	Cephalic index.	Head length.	Head breadth.	Stature.	Map letter.	Age.
13	73·8	191	141	1640	b	39
14	74·0	200	148	1680	<i>d</i> *	adult
15	74·1	185	137	1640	D	19
16	74·2	194	144	1685	<i>x</i>	21
17	74·2	190	141	1545	<i>D</i>	31
18	74·2	190	141	1670	D	31
19	74·6	193	144	1665	<i>x</i>	20
20	74·7	194	145	1630	D*	adult
21	75·0	200	150	1600	<i>r</i>	40
22	75·0	196	147	1665	E	adult
23	75·0	196	147	1715	<i>e</i>	43
24	75·0	196	147	1725	<i>E</i>	35
25	75·4	199	150	1700	<i>r</i> *	20
26	75·4	199	150	1555	E	25
27	75·5	208	157	1850	<i>E</i>	32
28	75·5	192	145	1675	E	55
29	75·9	195	148	1590	<i>E</i> *	adult
30	76·0	196	149	1730	<i>x</i>	19
31	76·0	179	136	1615	<i>F</i>	25
32	76·1	180	137	1650	<i>F</i>	39
33	76·2	193	147	1620	<i>x</i> *	adult
34	76·2	193	147	1630	F	adult
35	76·2	193	147	1560	<i>f</i>	32
36	76·3	190	145	1725	<i>f</i>	22
37	76·3	186	142	1560	<i>r</i>	32
38	76·5	179	137	1640	<i>F</i> *	adult
39	76·7	193	148	1675	F	23
40	76·7	197	151	1645	<i>F</i>	19
41	76·7	193	148	1815	F	40
42	76·9	195	150	1665	<i>F</i>	52
43	77·1	192	148	1640	<i>G</i> *	adult
44	77·1	179	138	1725	<i>g</i> *	20
45	77·1	201	155	1710	<i>g</i>	adult
46	77·2	197	152	1670	<i>G</i> *	24
47	77·3	198	153	1590	<i>g</i> *	adult
48	77·3	181	140	1640	<i>G</i>	29
49	77·4	186	144	1690	<i>x</i>	26
50	77·4	190	147	1625	<i>G</i> *	adult
51	77·4	199	154	1510	<i>g</i>	adult

TABLE 14.—WESTERN MONTGOMERYSHIRE—*continued*.

No.	Cephalic index.	Head length.	Head breadth.	Stature.	Map letter.	Age.
52	77·5	182	141	1600	<i>G</i>	35
53	77·6	192	149	1625	<i>g*</i>	26
54	77·7	193	150	1675	<i>x</i>	21
55	77·8	198	154	1715	<i>g</i>	38
56	77·9	190	148	1605	<i>g*</i>	adult
57	77·9	195	152	1745	<i>g</i>	22
58	78·0	186	145	1690	<i>h</i>	19
59	78·1	192	150	1730	<i>H*</i>	46
60	78·1	196	153	1660	<i>H*</i>	26
61	78·1	187	146	1635	<i>h*</i>	adult
62	78·3	194	152	1650	<i>h</i>	adult
63	78·3	184	144	1590	<i>h*</i>	19
64	78·3	203	159	1635	<i>h</i>	50
65	78·4	190	149	1720	<i>H*</i>	adult
66	78·4	185	145	1625	<i>H</i>	38
67	78·5	186	146	1665	<i>h</i>	21
68	78·7	193	152	1665	<i>h*</i>	adult
69	78·7	183	144	1590	<i>h</i>	25
70	78·8	184	145	1665	<i>H*</i>	adult
71	78·9	189	149	1560	<i>h*</i>	40
72	78·9	199	157	1740	<i>h*</i>	19
73	78·9	190	150	1625	<i>H</i>	37
74	78·9	199	157	1705	<i>H</i>	33
75	79·0	195	154	1720	<i>J</i>	39
76	79·1	191	151	1715	<i>J*</i>	22
77	79·2	192	152	1710	<i>J</i>	26
78	79·2	187	148	1625	<i>J</i>	30
79	79·2	187	148	1670	<i>J</i>	adult
80	79·3	193	153	1750	<i>j*</i>	adult
81	79·3	193	153	1700	<i>j*</i>	adult
82	79·5	190	151	1695	<i>J</i>	34
83	79·6	186	148	1620	<i>x*</i>	adult
84	79·6	196	156	1700	<i>j*</i>	40
85	79·7	192	153	1670	<i>R</i>	21
86	79·8	183	146	1575	<i>j*</i>	adult
87	79·8	183	146	1710	<i>J</i>	adult
88	79·9	194	155	1665	<i>j*</i>	adult
89	80·0	200	160	1600	<i>R*</i>	59
90	80·6	180	145	1635	<i>R*</i>	32

TABLE 14.—WESTERN MONTGOMERYSHIRE—*continued.*

No.	Cephalic index.	Head length.	Head breadth.	Stature.	Map letter.	Age.
91	80·8	193	156	1590	<i>K</i>	adult
92	81·0	190	154	1745	<i>L*</i>	21
93	81·0	190	154	1665	<i>R</i>	28
94	81·7	186	152	1560	<i>L*</i>	adult
95	81·9	193	158	1710	<i>L</i>	adult
96	82·9	193	160	1650	<i>M</i>	26
97	83·0	194	161	1665	<i>n*</i>	adult
98	83·2	190	158	1745	<i>N*</i>	20
99	83·4	193	161	1715	<i>n</i>	60
100	84·2	195	164	1675	<i>P</i>	30

N.B.—Some of those included in the above list are also on the Plynllymon list and on the list of the men with indices below 73.

TABLE 15.—NORTH MONTGOMERYSHIRE AND THE BERWYNS.

No.	Cephalic index.	Head length.	Head breadth.	Stature.	Map letter.	Age.
1	72·8	199	145	1725	<i>a</i>	adult
2	74·5	200	149	1710	<i>d</i>	adult
3	75·4	195	147	1625	<i>E</i>	22
4	75·6	201	152	1675	<i>E</i>	29
5	75·7	202	153	1865	<i>e</i>	25
6	76·1	197	150	1650	<i>r</i>	20
7	76·3	194	148	1620	<i>F</i>	65
8	77·2	197	152	1705	<i>G</i>	adult
9	78·2	193	151	1790	<i>h</i>	adult
10	79·3	193	153	1660	<i>x</i>	25
11	80·0	190	152	1725	<i>K</i>	24
12	81·0	185	150	1700	<i>l</i>	23
13	81·1	191	155	1670	<i>x</i>	20
14	81·4	189	154	1645	<i>R</i>	19
15	81·6	185	151	1690	<i>L</i>	adult
16	82·8	186	154	1640	<i>M</i>	26
17	86·0	193	166	1690	<i>P*</i>	adult
18	86·1	187	161	1625	<i>p</i>	30

NORTH MONTGOMERYSHIRE AND THE BERWYNS.

(See Table 15, p. 105.)

This difficult region of high plateau, cut by numerous streams which drain into the Severn and Dee along the Welsh border, has not been systematically worked at the present stage, but a few cards obtained draw attention to interesting details.

Most of these people belong to the little market towns of the valley junctions rather than to the high plateau itself, and it is interesting to notice that, of the 18, 8 have cephalic indices of 80 or above, while 7 have indices of 81 and above. In noticing the English border farther north, we found 6 out of the 21 samples had decidedly broad heads, and these all came from near the emergence of the Dee on the English plain (p. 99). We therefore link that observation with one made here, and draw attention to these tributary valleys of the Dee and the Severn in south-east Denbighshire and North Montgomeryshire as apparently possessing a broad-headed strain of some importance. We do not think that two small random assemblages (cards from people measured here and there, mostly outside this area) would be likely to show this character, the same in both cases, if there were not some general fact behind it. We believe that, as in the hill-country of Flint, so here also, we should find a fair proportion of the Mediterranean stock on the moorlands, but we imagine that so high and bleak a moorland would be only sparsely inhabited above natural forest-level in Neolithic times. The broad-headed element probably stands in some relation to that which is so characteristic of the great Merionethshire cleft, but at any rate the type of nose so noticeable there is found in only one (marked by an asterisk) in this region.

This problem of the broad heads is one which is very difficult to study in Wales alone, and it should be merely noted for purposes of comparison after more has been done for the ethnographical mapping of England.

THE MONTGOMERYSHIRE BORDER, RADNOR, AND BRECKNOCK.

These have not yet been dealt with systematically, as the problem here is undoubtedly one of comparatively recent admixtures with types across the border. The fair element in the population is reasonably well marked everywhere, and long-headedness is dominant, but there are large numbers of the Mediterranean stock. In fact, the border may be considered to have the same general character as that noted for West Montgomeryshire, but with less of the pure and extreme Mediterranean type and more of the markedly fair type. This last is especially noteworthy in Brecknock, where are found many tall, fair men, some with broad heads.

We look upon the Welsh basins of Severn and Wye as zones of penetration of medium-headed, well-built, fair types into Wales, but whether they can be said to represent the Ordovices, whose country they inhabit for the most part, or the Brythonic-speaking conquerors of Wales, is more than we could say. The question is discussed at greater length in a subsequent section.

CARMARTHENSHIRE.

(See Tables 16 and 17, pp. 108–112, and Figs. 2–5.)

Our work has not covered Carmarthenshire very completely, but we have filled about 200 cards in the county: 84 of these cards relate to people with ancestry entirely in the districts of the Rivers Gwendraeth and Loughor, chiefly in Pont-y-Berem, Cross Hands, Felinfoel and other villages near Llanelly; 53 cards relate to people who belong entirely to the Towy valley; and another 53 belong to the other parts of the county, a certain number coming from the region of the Taf and its feeders. It will be remembered that what is strictly the moorland region of the north and especially of the north-west of Carmarthenshire has been discussed in connection with South Cardiganshire, and has been said to possess an important element of the Mediterranean race type.

That type is present throughout the county, needless to say, but neither its purer nor its extreme types are common in the areas here studied. Only 3 among 190 (84+53+53) have dark hair and eyes and cephalic indices below 73 (*i.e.*, 1·6 per cent.), as against 5 among 114 (or 4·4 per cent.) in North Cardiganshire; 53 men among our 190 have eyes and hair dark and head indices under 80 (*i.e.*, 27·9 per cent.), as against 169 among 529 (or 31·9 per cent.) in Cardiganshire. This percentage difference is not very well marked, but when we come to the people with black hair and dark eyes and cephalic index below 80, we find only 8 among our 190 (*i.e.*, 4·2 per cent.). This compares with 8·2 per cent. (approximately) for Cardiganshire, but we must remember that the northern plateau of Carmarthenshire is treated with Cardiganshire. The corresponding figure for Denbigh and Flint is 12·1 per cent., for Merionethshire 8 per cent. approximately.

South Carmarthenshire may thus be said to show the Mediterranean type, but in a somewhat diluted form; we have many with light eyes, and the blacker as well as the more extreme long heads are rather scarce. The average height (about 1660 mm.) of these long heads of dark colouring in south-east Carmarthenshire is well under the general average for Mediterranean types in Wales (about 1690–1695 mm.). In fact, we are here dealing with the well-known South Wales or Silurian type, so important in the coal valley population of Glamorganshire and Monmouthshire.

The pure fair type is fairly well and generally represented, but its distribution does not call for special comment so far as our experience goes. The reds are a very important group, numbering 25 among our 190 cards. These reds are comparatively scarce in the Towy valley, numbering only 4 among 53, so that there are no less than 21 among the 137 others. This is 15·3 per cent. as against 7·3 per cent. for the county generally. In the Tregaron district we found a distinct red nest, likewise at Plynlymon. In the Carmarthenshire case it is more difficult to fix a locality. Some of the reds occur along the mountain roads across the hills from Tregaron, several come from the villages near Llanelly (13 per cent. of the local sample), and some belong to the Taf district. We should therefore

incline to state that the coast region of Carmarthenshire, and perhaps the west of the county as well, was to some extent a nest of reds, though not in so marked a degree as the other nests identified. The reds here might well be the result of long-continued crossing between the well-marked fair and dark elements. General observation supports the view that there is much redness in the Taf valley.

The broad heads (index 81 and above) number 17 among our 190 (*i.e.*, 8·9 per cent.), as against 11·1 per cent. for Cardiganshire and 14·7 per cent. for Merionethshire—*i.e.*, the number is rather low, but it is noteworthy that the small sample from the Towy valley has a considerable portion of broad heads; they number 7 among the 53 (*i.e.*, 13·2 per cent.). This is an indication which general observation confirms.

On the whole, therefore, we should say that, as might be expected from its extensive prehistoric moorlands, Carmarthenshire has a good foundation of Mediterranean stock, but this stock is much mixed with fair types, probably coming in coastwise or from the sea. There is a characteristic red type found round Llanelly, in the Taf valley and elsewhere, but it is rare in the Towy valley. This last region—a fertile vale which is also part of a long through-route through Wales—has a characteristic broad-headed element which is not found in any numbers in the rest of the county.

The very remote districts, such as the upper valleys around the Black Mountains—*e.g.*, near Llyn-y-fan-fach—would probably yield some extreme examples of dark, long-headed types, if systematically searched. One might even find the traces of possible Palæolithic character noted by us for Plynlymon.

TABLE 16.—TOWY VALLEY.

No.	Cephalic index.	Head length.	Head breadth.	Stature.	Map letter.	Age.
1	73·7	194	143	1730	<i>b</i>	20
2	74·0	200	148	1620	<i>d</i>	28
3	74·2	198	147	1685	<i>D</i>	20
4	74·2	198	147	1705	<i>D</i>	24
5	74·5	200	149	1715	<i>D</i>	24
6	74·6	197	147	1650	<i>x</i>	21
7	74·7	198	148	1665	<i>D</i>	40
8	74·7	202	151	1795	<i>D</i>	21
9	75·6	201	152	1725	<i>e</i>	23
10	75·9	191	145	1720	<i>E</i>	adult
11	75·9	195	148	1735	<i>e</i>	19
12	75·9	195	148	1755	<i>e</i>	27
13	76·0	204	155	1705	<i>F</i>	24
14	76·0	196	149	1645	<i>j</i>	22

TABLE 16.—TOWY VALLEY—*continued.*

No.	Cephalic index.	Head length.	Head breadth.	Stature.	Map letter.	Age.
15	76·2	202	154	1760	f	24
16	76·2	193	147	1725	f	21
17	76·3	190	145	1595	F	24
18	76·4	195	149	1600	F	53
19	76·8	190	146	1710	F	30
20	77·4	195	151	1700	r	21
21	77·4	199	154	1655	G	27
22	77·4	195	151	1590	G	25
23	77·9	190	148	1665	r	21
24	77·9	186	145	1680	g	26
25	78·2	183	143	1690	h	31
26	78·4	195	153	1745	h	24
27	78·6	196	154	1755	H	23
28	78·6	196	154	1640	H	65
29	78·8	194	153	1785	H	20
30	78·9	193	152	1650	h	34
31	78·9	193	152	1670	r	22
32	78·9	194	153	1705	H	24
33	78·9	194	153	1710	h	21
34	79·0	195	154	1620	J	20
35	79·1	196	155	1690	J	26
36	79·2	197	156	1695	j	19
37	79·2	192	152	1650	J	21
38	79·3	193	153	1670	J	19
39	79·3	193	153	1785	j	19
40	79·3	193	153	1680	J	26
41	79·7	197	157	1735	J	adult
42	80·2	197	158	1685	k	41
43	80·3	203	163	1780	k	19
44	80·6	196	158	1765	R	43
45	80·7	197	159	1735	K	19
46	80·8	193	156	1780	K	22
47	81·0	195	158	1670	L	50
48	81·4	188	153	1620	L	24
49	81·5	200	163	1635	L	45
50	81·6	201	164	1735	L	33
51	81·7	190	155	1550	x	adult
52	82·0	200	164	1690	m	40
53	83·9	186	156	1675	n	25

TABLE 17.—SOUTH-EAST CARMARTHENSHIRE.

(Pont-y-Berem, Cross Hands, Llanelly.)

No.	Cephalic index.	Head length.	Head breadth.	Stature.	Map letter.	Age.
1	70·8	199	141	1620	<i>a</i>	27
2	72·1	201	145	1695	<i>a</i>	21
3	72·4	203	147	not taken	<i>r</i>	adult
4	73·5	196	144	1650	<i>B</i>	30
5	73·7	194	143	1700	<i>B</i>	28
6	73·9	203	150	1640	<i>r</i>	20
7	73·9	203	150	1650	<i>B</i>	27
8	74·0	196	145	1600	<i>D</i>	24
9	74·0	186	135	1690	<i>D</i>	28
10	74·1	205	152	1680	<i>d</i>	20
11	74·1	201	149	1700	<i>D</i>	24
12	74·2	194	144	1705	<i>d</i>	35
13	74·3	191	142	1740	<i>d</i>	23
14	74·4	199	148	1640	<i>d</i>	35
15	74·9	203	152	1700	<i>D</i>	20
16	75·1	193	145	1600	<i>r</i>	36
17	75·1	195	146	1640	<i>x</i>	32
18	75·1	197	148	1600	<i>e</i>	32
19	75·1	201	151	1750	<i>E</i>	24
20	75·1	201	151	1610	<i>E</i>	46
21	75·1	201	151	1790	<i>E</i>	30
22	75·2	202	152	1665	<i>E</i>	38
23	75·5	200	151	1690	<i>x</i>	21
24	75·5	204	154	1650	<i>E</i>	24
25	75·5	196	148	1570	<i>E</i>	19
26	75·9	195	148	1630	<i>E</i>	adult
27	75·9	195	148	1700	<i>E</i>	21
28	75·9	195	148	1685	<i>e</i>	25
29	76·0	192	146	1685	<i>f</i>	adult
30	76·2	202	154	1700	<i>F</i>	27
31	76·2	193	147	1790	<i>F</i>	40
32	76·4	195	149	1620	<i>f</i>	33
33	76·5	204	156	1715	<i>F</i>	30
34	76·5	200	153	1700	<i>f</i>	55
35	76·6	201	154	1595	<i>f</i>	54
36	76·6	205	157	1615	<i>F</i>	22
37	76·9	195	150	1615	<i>F</i>	adult

TABLE 17.—SOUTH-EAST CARMARTHENSHIRE—*continued.*

No.	Cephalic index.	Head length.	Head breadth.	Stature.	Map letter.	Age.
38	77·0	200	154	1720	<i>G</i>	34
39	77·1	192	148	1725	<i>g</i>	23
40	77·1	199	154	1705	<i>G</i>	21
41	77·1	201	155	1710	<i>G</i>	27
42	77·2	197	152	1770	<i>G</i>	27
43	77·3	198	153	1640	<i>G</i>	20
44	77·6	205	159	1800	<i>g</i>	29
45	77·7	197	153	1645	<i>G</i>	47
46	77·8	193	149	1625	<i>G</i>	45
47	77·9	204	159	1660	<i>g</i>	30
48	78·0	191	149	1645	<i>h</i>	29
49	78·1	192	150	1725	<i>H</i>	29
50	78·3	198	155	1615	<i>h</i>	51
51	78·3	189	148	1615	<i>h</i>	adult
52	78·4	194	152	1620	<i>h</i>	21
53	78·4	190	149	1660	<i>H</i>	20
54	78·6	196	154	1750	<i>H</i>	45
55	78·7	193	152	1770	<i>H</i>	24
56	78·7	196	155	1600	<i>r</i>	22
57	78·8	193	152	1690	<i>H</i>	26
58	78·9	194	153	1710	<i>x</i>	26
59	79·0	195	154	1690	<i>j</i>	24
60	79·2	197	156	1675	<i>R</i>	46
61	79·2	197	156	1650	<i>j</i>	28
62	79·4	194	154	1560	<i>R</i>	63
63	79·4	194	154	1640	<i>R</i>	64
64	79·5	202	161	1790	<i>R</i>	36
65	79·5	190	151	1640	<i>j</i>	46
66	79·6	182	145	1600	<i>J</i>	33
67	79·7	192	153	1635	<i>j</i>	24
68	79·8	193	154	1655	<i>j</i>	32
69	79·9	199	159	1705	<i>J</i>	60
70	80·1	191	153	1710	<i>K</i>	22
71	80·2	207	161	1810	<i>k</i>	60
72	80·3	198	159	1700	<i>k</i>	22
73	80·3	188	151	1670	<i>k</i>	19
74	80·5	190	153	1675	<i>k</i>	19
75	80·5	190	153	1620	<i>k</i>	37
76	80·8	188	152	1570	<i>K</i>	25

TABLE 17.—SOUTH-EAST CARMARTHENSHIRE—*continued*.

No.	Cephalic index.	Head length.	Head breadth.	Stature.	Map letter.	Age.
77	81·4	193	157	1625	R	adult
78	81·6	195	159	1585	/	25
79	81·6	195	159	1620	R	24
80	82·3	192	158	1810	R	20
81	82·6	196	162	1640	M	22
82	83·3	192	160	1690	N	adult
83	83·9	181	152	1640	N	26
84	87·6	186	163	1680	P	19

CARMARTHENSHIRE.

Cephalic index.	Black hair, brown eyes.	Brown hair and eyes.	Brown hair, light eyes.	Light hair and eyes.	Light hair, dark eyes.	Reds.	Total.
Under 73	1	2	0	0	0	1	4
73	0	1	3	1	1	2	8
74	2	5	6	5	1	1	20
75	0	6	12	3	2	2	25
76	2	7	4	6	0	0	19
77	1	5	8	6	0	2	22
78	1	11	9	3	1	5	30
79	1	8	4	7	0	7	27
80	2	6	3	4	2	1	18
81	0	1	1	3	1	2	8
82	0	2	0	1	0	2	5
83	0	1	1	1	0	0	3
84 and over	0	0	1	0	0	0	1
	10	55	52	40	8	25	190

THE SOUTH COAST OF WALES.

It is felt that the ethnographical problem of Pembrokeshire, Gower and the Vale of Glamorgan differs deeply from that of the remainder of Wales, and would need, even more than this latter, a knowledge of the ethnography of England for its solution. These are areas which have been visited by Dolmen-builders, Bronze

Age traders, immigrants from Ireland, Sea-Rovers, Normans, Flemings, Huguenots, and probably even others, and to distinguish them anthropologically, especially as regards the many varieties of broad heads, would be a task of extreme difficulty. Probably a distributional study of fair types will show that they are abundant in South Pembrokeshire and patchily distributed towards the north as far as the line of the Rivers Ystwyth and Wyre.

Needless to say, the Neolithic stock or Mediterranean race is well represented even on the south coast, for the moorlands are ceaseless exporters of men, but in those districts which are purely agricultural that ancient stock is by no means so dominant as it becomes in industrialized or coal-mining areas, such as that north of Gower.

These localities have a considerable fair-haired element with indices for the most part between 75 and 80, and there are also dark, broad-headed people in considerable numbers near the South Glamorgan coast and elsewhere, but the detail cannot be worked out at present.

We incline to think of the Anglicizing of these regions as the result of the adoption of English as a *lingua franca* between the various elements mentioned, at some time when human locations were brought into general relation with one another, as, for example, through the building of the Norman and Plantagenet castles at stations along the through roads of the South Welsh coast-lands.

In considering the linguistic boundary one must remember the former wood and swamp condition of vales intervening between the coast occupied by immigrants and wanderers and the aboriginal moorlands above.

Reference should be made to Dr. Beddoe's¹ summary on Pembrokeshire.

SUMMARY OF TYPES AND DISTRIBUTIONS IN WALES.

1. The fundamental type is certainly the long-headed brunet of the moorlands and their inland valleys. He is universally recognized as belonging to the Mediterranean race of Sergi and as dating back in this country to early Neolithic times. Close analysis reveals varieties of this type as follows:—

- (a) A Mediterranean type with head length about 204, head breadth about 153 mm., cephalic index about 75, occiput well marked, but glabella not very prominent, nose straight, complexion inclined to swarthinness. Skull form usually ellipsoid or ovoid (Sergi's types). Hair and eyes very dark. Stature about the general average—*i.e.*, about 1690 mm. This type is highly characteristic of the inland valleys around the "prehistoric moorlands" of South Cardiganshire, North Pembrokeshire, and North Carmarthenshire. We think it represents a Mediterranean type with a possible trace of older types. (Plate I, 2A and 2B, and perhaps Plate IV, 4, and Plate V, 6.)

¹ Beddoe, *The Anthropological History of Europe*, pp. 145–151 (1912 edition).

- (b) A Mediterranean type with head length about 196 and head breadth about 153—*i.e.*, a type with occiput less prominent than in the preceding one. Cephalic index about 78, beloid form of the skull probably most characteristic. Nose straight; pigmentation of skin, hair and eyes, especially the last, less marked than in No. 1 (a), especially among males. Stature rather lower than in No. 1 (a). A rather smooth contoured head and face variety of this type, and, to some extent, of No. 1 (a) is the characteristic Silurian type so well known from the valleys of the Glamorgan and Monmouth hill-country, and it is found also around the small moorlands farther west. Under healthy conditions this type may have a fine fresh colour. We think the darker representatives of this type, with high absolute head length, the most typical members of the Mediterranean stock. Those with rather less pigmentation show a characteristic dilution of other characters; they are only very rarely prognathous and the occiput is not well marked.
- (c) A Mediterranean type with narrow head, say 198 mm. by 148 mm. (*i.e.*, cephalic index rather below 75) with rough features and especially rather prominent cheek bones. The forehead is well developed, the occiput moderate, the head rather high, prognathism not general, stature variable but inclined to be above the average, and general build somewhat loose. Some persons with these general characteristics have black lank hair and, especially if they happen to be slightly sallow, they inevitably suggest the Mongolian and, more especially, a Japanese-noble type. Some such type interested Beddoe¹ and from some of his photographs which we have seen it might be the same as ours, but he says his type is probably related to that of Furfooz or Grenelle. These Neolithic European stocks were, however, broad-headed,² so we doubt this identification. Beddoe calls the type "Mongoloid," and notes 34 instances with cephalic indices varying from 72 to 86 and averaging 78-9. On the whole we are, therefore, inclined to reject Beddoe's homology of his "Mongoloid" type with those of Furfooz and Grenelle. We do this all the more because we do not find the "Mongoloid" character to any extent associated with broad-headedness.

This character is one which is difficult to study, as it is a matter of very fine shades of difference, and we should not be averse to dropping the term "Mongoloid" altogether. If we have at times set out to look for Mongoloids we have found rather too many, and we are inclined to think that we have to do with a type which has the eyelid opening lengthened out laterally, probably in correlation with strong growth of the zygomatic arches. We may note here Boyd-Dawkins' surmise³ that

¹ Beddoe, J., *Races of Britain*, 1885, pp. 8-13.

² Déchelette, J., *Manuel d'Archéologie*, 1912, vol. i, p. 483.

³ Boyd-Dawkins, W., *Cave Hunting*, 1874, p. 353; *Early Man in Britain*, 1880, p. 233.

the modern Eskimo, classified under the Leiotrichi and mostly dark and long-headed, are related to one type of Western European Palæolithic men.¹

The question of a possible homologization with the type of Cro-Magnon and Laugerie Basse is worth raising. The type individual had an index of 74 on the skull (75·5 on the living head), but his measurements were all very large²—maximum length 203 (212–13 with tissues) maximum breadth 150 mm. (159 with tissues). Not all Aurignacian types, however, reach these figures, which are very exceptional, though approached by one at least of the tall, dark long-heads on our Denbighshire list. (See pp. 67–68.)

The height of the head, the prominence of the zygomatic arches, the tendency to surpass the average in stature, the well-developed forehead and moderateness of the brow ridges are all points of likeness, but are stated without a desire to emphasize a point, which must remain doubtful for the present.

In this connection it is interesting that this type, or these types, occur especially in North Wales, so far as our present information goes. The Neolithic settlement areas of North Wales are for the most part small moorlands, and are isolated in many cases by what must have been formidable barriers in the shape of deep wooded ravines. The Neolithic settlement areas in South Wales, on the other hand, are larger, lower, more contiguous and continuous, and much more sunny. In the former we might expect, perhaps, to find old stocks shut in and protecting themselves by wilful isolation (see p. 145, *re* folklore), whereas the latter might more easily receive and absorb successive waves of immigrants. The latter might thus have very typical average Neolithic people; the former, as also any patches of special poverty and isolation in the south, might, on the other hand, show remnants of early Neolithic immigrants, among whom might even be surviving descendants of Palæolithic types. (Plate V, 5, doubtfully, and Plate IV, 4, very doubtfully; both of these are Mediterraneans with zygomatics well marked.)

- (d) A Mediterranean type which seems to resemble the Borris skull³ as already discussed on pp. 62–63 (Plate I, 1A, 1B, Plate IV, 5, Plate V, 1, 2). This type is characteristic of the Plynlymon moorland, an isolated, impoverished, bleak moorland, impoverished probably still further within historic times through completion of the replacement of its forest by peat. It has already been mentioned that Borlase⁴ found an Irish skull of this type

¹ Testut, "Squelette de Chancelade," *Bull. Soc. Anthropol. Lyon*, VIII, 1889. He draws attention to resemblances between the Chancelade man and the Eskimo, in the height of the narrow head, the length of the face, the great breadth of the zygomatic arches, and the very short stature. The Chancelade face is very different from that of Cro-magnon man.

² Keith, A., *Antiquity of Man*, 1915, p. 54; *Reliquiae Aquitanicae*, 1865–75, pp. 111 ff.

³ Laing, S., and Huxley, T. H., *Prehistoric Remains of Caithness*, 1866, pp. 125 ff.

⁴ Borlase, W. C., *Dolmens of Ireland*, 1897, pp. 922 ff.

belonging to the early centuries of our era, and it is generally surmised that there are survivals of this type in modern Ireland. Its ultimate homologies remain doubtful, the brow recedes too much for us to approximate the type to most of the Aurignacian skulls known, and there are many objections to the assumption of Neanderthaloid relationships save, perhaps, of a very distant kind. The rather striking resemblance to the Galley Hill type is less valuable than it might be, because the period of the Galley Hill skull is a matter of dispute, and if that skull is really Chellean, as is sometimes claimed, that period is too far off to make a claim of kinship of much value.

Rice Holmes¹ has a useful note on this point, which we quote here:—

“MM. de Quatrefages and Hamy affirm that the Neanderthal race has left a permanent imprint on the population and refer to various skulls of the Neolithic and later periods which resemble more or less closely that of Neanderthal. Moreover, it is generally admitted that even at the present day a few individuals here and there belong to the same type. But it does not follow that these persons to whom Dr. Beddoe and M. Hamy refer were descended from men who lived in Britain in the Palæolithic Age.”

Keith² and other modern workers would not agree with the idea that it is the Neanderthal race which influences modern types. All that is really meant is a long-headed stock with rough features, strong brow ridges, low receding forehead, and head measurements all large except the auricular height.

- (e) A Mediterranean type with reminiscences of negroid character, perhaps suggesting links with the Palæolithic negroids described by Verneau³ from the Grottes de Grimaldi. This type is rather small, shows marked dolichocephaly, often without large measurements, has dark eyes, black hair, which is closely curled, a rather broad nose and short stature. We have met only the slightest traces of this type, and think it wise to do no more than mention it at the present stage (Plate IV, 6).

Other types found in Wales include the following:—

2. Nordic and Nordic-Alpine types. These grade into one another so closely that it is difficult to make more exact subdivisions. It will be noticed in our tables that the cephalic indices of fair types vary within broad limits, but that the numbers with indices under 76 or over 81 are often small. Here and there some upward extension of this limit is traceable, and we think it would be noticed on the Welsh border and in Brecknock. We tentatively subdivide as follows:—

¹ Holmes, T. Rice, *Ancient Britain*, 1907, p. 385.

² Keith, A., *Antiquity of Man*, 1915, *passim*.

³ Verneau, R., “Les Grottes de Grimaldi” (Baoussé-Roussé, *L'Anthropologie*, 1906).

- (a) A type with light brown or fair hair, eyes which are often blue and only rarely brown flecked, considerable strength of brow and of jaw and chin, good features, mesaticephaly as a general character, frequent tall stature. Newcastle Emlyn is a well-marked nest of this type, and it is somewhat characteristic at Towyn. Needless to say, it is very marked in several localities in South and South-west Pembrokeshire. This type seems to be the local version (Plate III, 1, Plate IV, 1) of the Nordic type so far as we can judge from a comparison of our results with the conclusions of G. Retzius.¹
- (b) A somewhat heavier variant of the above, with shorter head than the above and extremely tall stature. The cephalic index would be above 80 in many cases, on the living head. The face hair of the men is usually rough. We think these men will be identified to a considerable extent on the Welsh border and suspect that, mixed with 2 (a), they may represent the Brythonic wave of immigration into Powys (see pp. 142-147).
- (c) The Borreby, or Beaker-Maker Type (Plate III, 2A, 2B, Plate IV, 2, and (?) Plate V, 3, 4). Probably tall and often fair, light eyed, broad headed, short faced. There seem to be darker grades of pigmentation, as might be expected if we are right in surmising that we are dealing with a cross between broad-headed and rather dark Alpines on the one hand, and longer-headed fair Nordic types on the other. The convex nose-profile occurs frequently. The brows are well marked, and the fine forehead usually recedes considerably. The type is discussed at greater length on pp. 86-87. It is characteristic of the long cleft from Corwen *via* Bala to Talyllyn and Towyn.

3. Not very commonly seen. Dark, bullet-headed, short, thick-set men, of the general type denoted by the term Alpine and more exactly, perhaps, by the term Cevenole. It has seemed to us that there are several representatives of this type among the inhabitants of the North Montgomeryshire valleys leading down to the English border, but there cannot be said to be any "nest" of them as yet known. We feel the need of a survey of English types before discussing this in more detail.

4. Powerfully built, often intensely dark, broad headed, broad faced, strong and square-jawed men characteristic of the Ardudwy coast, the South Glamorgan coast, the Newquay district (Cardiganshire), Pencaer in North Pembrokeshire and other places. The stature would seem to be about average, but some individuals are very tall indeed (Plate II, 1A, 1B). A further discussion of this type will be found on pp. 89 and 137-142.

Note.—In addition to the above types we have the following:—

- (a) Rather tall, powerfully built men with large, broad, high heads, high foreheads, strong eyebrows, usually medium brown hair with light eyes and,

¹ Retzius, Gustav, "The so-called North European Race of Mankind," *Journ. Roy. Anthropol. Inst.*, xxxix, 1909, p. 277.

frequently, a rufous beard. These occur chiefly along the coasts. It would seem that the type is some variant of No. 2 above, possibly with No. 4 also influencing it.

- (b) Fair, medium to broad headed men with slight rufous tendencies, found in South-west Wales. Often less powerfully built than (a), features less strong in most cases (Plate IV, 3).
- (c) "Red" people, that is people with distinctly red hair, and not merely a suggestion of redness in what is really a fair type. These people typically have strong zygomatic arches with a sinking of the cheek below the arch. The chief centres for these are the Plynlymon moorlands, the neighbourhood of Tregaron (Cardiganshire), the Taf, and possibly the Gwendraeth regions of Carmarthenshire. There are, no doubt, other localities not yet sufficiently determined, but this type seems scarce in most parts of Merionethshire. It is claimed to exist also in North and North-west Denbighshire, and we hope to discuss this in a future paper.

This distribution does not suggest that the "red type" is an independent one, and it may possibly be a result of persistent crossing, but for further elucidation of this point study of pedigrees and family portraits will be very necessary. A cephalic index of less than 75 is not at all common amongst red-haired people in Wales, and this of itself suggests that the red type is in some way related to the fair type. (Nordic, see No. 2 above.)

In the next section of the paper an attempt, which will necessarily be somewhat speculative, will be made to suggest certain hypotheses as to race history in Wales and in Britain as a result of our Anthropometrical Survey of Wales, and correlated archæological and geographical study. It should, however, be understood beforehand that no claim is made to identify a Goidelic or a Brythonic or a more generally Celtic type. These are names in linguistics, and it is dangerous to apply them in physical anthropology. From descriptions in the *Mabinogion* it would seem that the princes and princesses were often distinguished by their yellow, golden, or fair hair, so that, possibly, the general mass of the people was dark at the time when the Celtic romances were gaining their definitive shape, *i.e.*, the "Mixed" race conditions of the population certainly go extremely far back. It may, in fact, be wondered whether either branch of Celtic-speaking invaders, or even the Bronze Age invaders, if these latter were pre-Celtic, were pure stocks.

Reference will be made in the sequel to most of the types above listed and the numbers will be given for reference.

Nothing will be said, however, of No. 3 (the Alpine-Cevenole type). It would be interesting to hunt for it among the upper ends of valleys of Shropshire and the Welsh border generally. The "Red" Type will also be neglected, as the accepted hypothesis is that it is not an independent type but may arise anywhere as a result of crossing, and more evidence is necessary for re-discussion.

A few points of general interest may be noted here. Types 1 (a) to 1 (e) con-

tribute considerable numbers to the ministries of the various churches, possibly in part from inherent and racial leanings, but partly also because these are the people of the moorlands. The idealism of such people usually expresses itself in music, poetry, literature and religion rather than in architecture, painting, and plastic arts generally. They rarely have a sufficiency of material resources for the latter activities. These types also contribute a number of men to the medical profession, for somewhat similar reasons no doubt.

The successful commercial men, who have given the Welsh their extraordinarily prominent place in British trade (shipping firms for example), usually belong to types 2 or 4, rather than to 1, as also do the great majority of Welsh members of Parliament, though there are exceptions of the first importance.

The Nordic type is marked by ingenuity and enterprise in striking out new lines. Type 2 (*c*) in Wales is remarkable for governmental ability of the administrative kind as well as for independence of thought and critical power.

THE ETHNOLOGY OF SOUTH BRITAIN IN CONNECTION WITH THE FOREGOING OBSERVATIONS.

In spite of the fact that the questions of British Ethnology have been discussed so often, we think it incumbent upon us to sketch out a synthesis of the population of South Britain, in relation to our work. In order to reduce the length of this portion of our statement within manageable dimensions, we ask readers to refer for previous discussions of the questions involved to :—

Keith, A., *Antiquity of Man*, 1915.

Holmes, T. Rice, *Ancient Britain and the Invasions of Julius Caesar*, 1907.

Déchelette, J., *Manuel d'Archéologie*, 1912-14, Paris.

Dottin, G., *Manuel Celtique*, 2nd Edition, 1915, Paris. Ed. Champion.

Our summary will give only a minimum number of references to literature, and we hope that this will not be misinterpreted as a neglect of previous authors—it is rather a tribute to the comprehensiveness of treatment in the general studies just named.

We think it is most useful to commence our survey by attempting to recreate in imagination the Britain of early prehistoric times, after the end of the Ice Age at any rate. On the question of the continuity of Palæolithic and Neolithic life in or near Britain our work has only a very slight bearing, which we may mention briefly. It has been inferred above that among the Neolithic types in the population there are, for example in North Wales (Gwynedd), what may be marked traces of the Cro-Magnon (Aurignean) or other earlier stocks, and their locations are related to some of the smaller and poorer moorlands, places of refuge and of isolation (1*c* in list). We have also hinted at certain, perhaps very ancient, relationships for our Plynlymon variety which probably exists also in Ireland (1*d* in list). These types may be the remnants of some early Neolithic immigration up from the South (Gaul), for such immigration would include “Palæolithic sweepings”; but the

probability that we have actual nests of these ancient types fairly readily distinguishable from the average Neolithic stocks seems to hint that there was continuity of life from Palæolithic to Neolithic not very far away from Britain to say the least. Peake suggests¹ that possibly the finds at Cissbury and Grimes' Graves may be interpreted as survivals of Palæolithic life in early Neolithic times, and he adds some interesting notes about survival of types, with which on the whole we are inclined to agree.

It is fairly generally agreed that even if the Palæolithic period graded into the Neolithic without a break, whether actually in Britain or in some region near by, the serious adaptation of Britain to human needs began with Neolithic immigration, for if Palæolithic man was a mere wild hunter, spreading more or less in Britain in the warmer intervals of a Glacial Age, his numbers must have been very small. Indeed, allowing that some parts of Britain were perhaps mere Tundra at the best, one may imagine, with some show of reason, that only in favoured periods (such as, perhaps, the Aurignacean) would the population have reached, at a rough estimate, four figures. A hunting population is bound to remain very sparse.

It will, therefore, be advisable to picture first of all the relations of Britain and Western Europe in early Neolithic times.

The Neolithic Immigration into Britain.

We may think of the Mediterranean region and even the Sahara enjoying a fairly cool climate while the ice still spread over Britain, and then we imagine the northward shift of climatic belts as the ice diminished and disappeared. With this shift went a corresponding human migration, for the north of Africa would become drier and less fit for man, and the country redeemed from the ice would become more suitable.

The ways northward from the Mediterranean region must have been somewhat limited at first. The Alps would long retain their ice sheet and thus remain inhospitable, so would the Illyrian Mountains, the Balkans, and the Carpathians. The chances of northward migration in early times from the Eastern Mediterranean or the Adriatic would thus be restricted, and the limitations would be found to be still greater if the physical conditions (*e.g.*, a possible large cold inland lake in the Hungarian basin) were worked out in detail.

Farther west the window between the Alps and the Pyrenees offered some opportunities, but the valley of the Rhone would probably not be used. Even as late as the La Tène period the Rhone valley was only just coming into use. "A l'époque de la Tène le commerce massaliote (*i.e.*, of Marseilles) mit la Gaule centrale en relation régulière avec la Méditerranée, mais auparavant ce n'est pas par la vallée du Rhône que les influences helléniques se sont exercées sur les Celtes; c'est par la voie des Argonautes, c'est-à-dire par les vallées du Po et du Tessin et par les lacs de la Suisse." This summary by Déchelette² gives the substance of views he

¹ Peake, H. J. E., "The Excavations at Grimes' Graves," *The Antiquary*, 1915, pp. 375 ff.

² Déchelette, J., *Manuel d'Archéologie*, 1913, ii, p. 569 and pp. 580-7.

has argued out with many references to literature, and they need not be argued afresh, for, as far as the Rhone valley is concerned, there is little difference of opinion. An imaginative reconstruction on the spot of post-glacial forest conditions in the Rhone valley from Lyons down to beyond Valence helps one to realize what efforts were needed before that region became other than a barrier to human intercourse, and one realizes the separateness of the Halstatt culture of the Côte d'Or from contemporary affairs on the Mediterranean coast of Provence, etc. Peake¹ has gathered independent evidence for the early separateness of the Provençal region from the Saone region which is fairly convincing.

The more westward route, however, along the northern flank of what afterwards became the gate of the Carcassonne, was largely along Les Causses, a limestone country and therefore bare and open. This north-westward route from Narbonne, probably along the windswept and thus bare western brow of the great Massif Central of France, is marked out as one of the ancient tracks of mankind. North-westward it would utilize the low, but bare, uplands of La Gâtine, and so it would reach Brittany and Le Cotentin.

In addition to this line of migration there would also be a possibility of movement along the coast of the Iberian Peninsula, but it will be generally allowed that the Neolithic period must have advanced far before that route could lead men in any numbers to Brittany. We are not aware that anyone would say that the strictly northern coast-line of Spain has changed very much in human times, and consequently the possibilities of migrations towards France would probably be fairly limited. Much of the interior of Spain was doubtless bare, and this must naturally be remembered as giving opportunities for movement. But if any northward movement passed the perennial barrier of the Pyrenees at the eastern end it would simply come into the Narbonne-Brittany line already discussed. The possibility of movement around the western end of the Pyrenees and then up the Biscayan coast of France is thus the one alternative. For a long time the Landes of South-west France have been an important hindrance to movement, but it would be easy to argue back too far on such a point.

It will be remembered that Ripley² argues for the survival of the "Cro-Magnon" type in large numbers along the plateau edge and just off it, in the Dordogne county (Perigueux and Angoulême). We think it probable from the maps he gives that the Mediterranean race may be more prominent in Médoc and other coastal districts of West France than his statements lead one to think, but, at all events, his collation of observations so far strengthens our main point, which is the importance of the Narbonne-Brittany line of movement from very remote times.

We thus have people spreading from the Mediterranean along one way or the other, and principally no doubt along the way we have discussed, reaching the south shores of the English Channel, and doubtless getting to Britain, whether across a

¹ Peake, H. J. E., "The Early Bronze Age in the Lower Valley of the Rhone," *Revue d'Ethnographie et de Sociologie*, Paris, 1914, pp. 57-64.

² Ripley, W. Z., *Races of Europe*, 1899, pp. 163-179.

then dry-land portion of the Channel, or across a strip of water possibly much narrower than it is now.

There is no dispute about the ancient population of the Mediterranean littoral, apart from the Balkan Peninsula; it persists in most districts and is dark, long-headed, oval-faced and short. The facial contours are often smooth. We may thus suppose that it was this type, with Palaeolithic admixture from the central plateau of France, that brought Neolithic culture to Britain.

Conditions and Locations of Neolithic Life in Britain.

In the earlier part of this paper it has been shown that Neolithic types, with or without much Palaeolithic admixture, persist in abundance in Wales and are specially characteristic of the inland valleys around certain moorlands which are their immemorial homes. The underlying geographical fact seems to be that Britain is in the region of temperate deciduous forest and, in its pre-human condition, the valley sides were forested and the valley floors were either woodland or swamp. The woodland was the haunt of the wolf and the wild boar, marten, wild cat, and other dangerous animals; and man, equipped with but stone tools, was not able to do much against the wet forest full of these dangers. Moreover, ague must have been a serious plague in the wet low ground. He thus settled chiefly on the uplands, the stretches of bare and windswept moorland on which we find traces of his work and his memorials (Fig. 6).

The Downs of the South of England offered many advantages. The chalk surface meant that the land was dry and forest-free, save in a few hollows where alluvium might accumulate. The chalk was workable with antler and wood picks, and so ramparts and earthworks could be scarped out. There was flint available, often within the earthwork itself. The Downs are nowhere very high and their southerly position gives them further climatic advantages: they have considerable sunshine and fair rainfall. The long straight ridges offered advantages for trackways for change of pasture, and there were many springs, arising not so very far below these ridgeways, from beneath the base of the chalk along its scarp edge.

One should notice particularly the amount of moorland hill-pasture, and other uncultivated land at the present day at the 500-foot level or below it around St. Alban's Head, Dorset.

The Western Downs and the White Horse Hills would share most of the advantages of the North and South Downs.

From them to the Mendips, or farther south to the Blackdown Hills, was a short transit, and on both these areas there was considerable opportunity for early settlement. From the Blackdown Hills to the southern slopes of Exmoor and so on to Dartmoor and the moors of Cornwall was a possible line of movement, and we think most of these areas will be found to have been occupied in Neolithic times. We also think the Neolithic type would probably be found in several places in inland valleys around these upland areas if looked for at the present day.

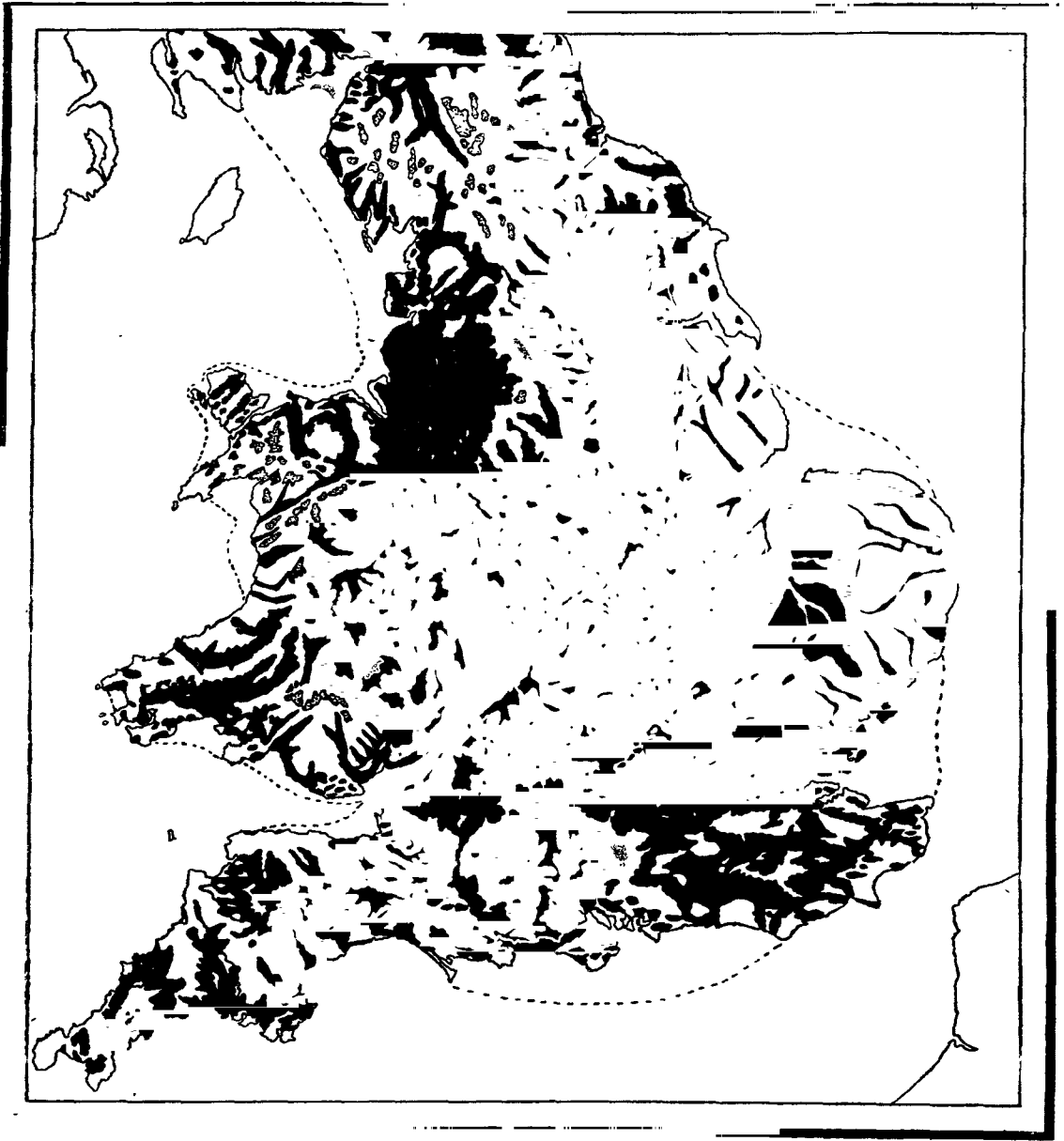


FIG. 6.—TENTATIVE MAP ILLUSTRATING THE CHIEF LOCATIONS (WHITE) PRACTICABLE FOR NEOLITHIC LIFE IN BRITAIN.

The black indicates country sparsely occupied at that time, mainly because of swamp and forest.

Islets in the swamp and patches of open forest (without tangled undergrowth) would, however, be used to some extent.

Areas made difficult by great elevation and rocky character are stippled.

In Neolithic times the absence of flint would be a drawback at first in South-west England, but, as the art of grinding stone grew up, that drawback would operate no longer, as various rocks of the South-western Peninsula would lend themselves to grinding.

We think it is generally agreed that the lines of the Downs have been lines of immigration, intercourse, and conflict for long ages in the past, and it would therefore be natural if the older strata of the population had ultimately become difficult to distinguish. We believe the type does occur in numbers among the inhabitants of patches of sandy heath and other poor soil areas near the Downs, *e.g.*, the north-west side of the New Forest. On these sandy areas the Neolithic culture is also said to have lingered after the Bronze culture had spread on the chalk uplands close by.¹ Romney Marsh seems also to have retained Neolithic types.

The Neolithic type is well known and abundant in South-west England (including Somerset to some extent), and belongs very characteristically to the valleys around Dartmoor and the moors of Cornwall. One might associate this survival with the remoteness of the district, but there is always a danger of referring to remoteness as though conditions were similar in all periods. Devon and Cornwall are remote from London or from Dover, but we shall discuss other routes later on for which Devon and Cornwall must have been not far from the main line.

The Thames basin must have been in the main a barrier and the southern end of the Chilterns, with drift over the chalk, was forested, as were most of the drift-covered chalk surfaces of East Anglia; the chalk valleys of that region, on the other hand, would have been bare, and the chalk edge over against the Fens would be bare also; Crawford² shares this view.

Farther west, the Western Downs and Mendips would almost connect with the open country of the Cotswolds, and so on via Edgehill either to the Clent Hills and Cannock Chase or to the Northamptonshire heights. The greater part of the Midlands must have been very inhospitable, as Abercromby³ also urges, and, in the Midlands generally, the survivors of the Neolithic population are probably not abundant, but according to Beddoe⁴ they are fairly numerous about the Leicestershire and Northampton heights and it is generally allowed that they are also numerous round about the Chiltern Hundreds.

The latter case may be the result of the protection London's resistance to Anglo-Saxondom offered them, if Gomme⁵ is right, during the post-Roman chaos, but without emphasizing this view we may account for this survival if we remember that the London Clay to the north of the Thames, and the Boulder-Clay-covered slopes of the Chilterns long remained forested and so gave shelter to refugees in post-Roman times. The former case is a region of woodland with, as

¹ Johnson, W., *Folk Memory*, 1908, p. 46.

² Crawford, O. G. S. *Geographical Journal*, 1912, vol. xl, pp. 184-7.

³ Abercromby, J., *Bronze Age Pottery*, 1912, pp. 81 and 109.

⁴ Beddoe, J., *Races of Britain*, 1885, p. 254.

⁵ Gomme, Sir G. L., *London*, 1914, pp. 74-120.

Beddoe¹ points out, fens to the east, a region into which the conquered folk might retreat or, perhaps also, a region in which even conquering invaders would be rather at a disadvantage in attacking a long-established population. Beddoe notes, however, a heavy incoming of French people into Bedfordshire after the Norman Conquest. It may be mentioned that Beddoe incidentally remarked that he did not believe the Saxons destroyed London.

In Norfolk it is generally allowed that the Neolithic type survives around Brandon, while it is found also in the Fens.

Generally speaking we should consider that, in England south of the Mersey-Humber line and east of the Quantocks and Blackdown Hills, the Neolithic type is fairly generally distributed but is characteristic chiefly, not of its primeval locations, but of the poorer, wilder districts into which it was forced to retreat, *i.e.*, districts which long remained forested or which are marshes. London, however, has a strong Neolithic strain, largely perhaps the result of immigration. This strain is characteristic of the poorer districts, and it appears that the Neolithic type is more resistant to the evil influences of slums and overcrowding and more psychically adaptable to their conditions than are most of the other elements of the population.

Looking farther north we find a considerable area of primeval open country in the Southern Pennines, the Yorkshire Wolds and the North York moors.

Elgee² says of high parts of the last named that on considering their superficial deposits as a whole, it must be admitted that they contain no evidence of ever having been covered with forests or even woods. There may have been occasional trees or shrubs.

Farther north still the Pennines include large areas of rock more than 2000 feet above the sea, and the zone fit for settlement would probably be found to be less extensive. In Cumbria also the sharpness of the slopes and the great valley lines would give only limited scope for early man.

As regards the Pennine district, the meagre details of post-Roman history allow us to see that the ancient population maintained a fairly effective struggle on its moorlands and their forest-clad eastern slopes against the Kingdom of Deira established by invaders on the low ground above the semi-estuarine marshes of the Ouse, and on the higher ground farther east. It is noticeable that this struggle was apparently most effective in Elmet, where the forested region round about the modern Leeds stretched well down towards the Ouse marshes.

The ancient population survives in large numbers at the present day around the Pennines, and naturally it is found more particularly on the Lancashire side, contributing a very important element to that character which makes Lancashire such an interesting factor in British life. On both sides of the Pennines the old population displays its powers of resistance to the evils of the poor quarters of the large towns. In considering the persistence of the old population in Lancashire

¹ Beddoe, J., *op. cit.*, pp. 254-5.

² Elgee, F., *Moorlands of N.E. Yorkshire*, 1912, p. 131.

one must remember that much of South Lancashire used to be very swampy, and that in this way access from the south was greatly limited in pre-industrial days. Local inquiry shows that even such a revolution as the Anglican schism in the sixteenth century affected Lancashire (from Wigan northwards and north-westwards) only very gradually and partially; some religious and economic features of that district at the present day may be surmised to be survivals of Mediaeval conditions.

In Beddoe's day,¹ apparently, the older population was not a very important element in the West Riding and there is need of local study to ascertain its proportions at the present time, but there is little doubt that in the second generation of big-town conditions this type has surged up in several parts. There is also little doubt that the changes in proportions of the types may have no small bearing on social and even political changes in the country.

This sketch of early centres of population in South Britain is given in the hope that it may encourage local inquiry with a view to more accurate and local observation in this field. The human locations in early Britain were, as we have seen, mainly in the south-west, south, east, and north. Those in the Midlands were less important, and consequently Wales was much isolated. This isolation was the more marked because the basins of the Dee and the Severn must have been most difficult to cross. One recalls both the Welsh and the English names for Shrewsbury, Pengwern (the head of the wood) and Shrewsbury (corrupted from the Borough in the Scrub) which, once the capital of a Welsh prince, was conquered by Mercia, and has gradually been, as it were, reconquered in modern times in peaceful fashion by more or less Anglicized Welshmen. It stood at a strategic point near one of the only practicable early routes, namely, that from the Clent Hills, Cannock Chase, Wenlock Edge, etc., across to the Longmynd and related highlands which led on to the Welsh moorlands. Ludlow stood at another, it may be added.

In all the border country, the export of men from the moorland has made the population Welsh to a considerable extent and the Neolithic blood is much in evidence, though it is rarely as pure as in the inland valleys of the truly Welsh coastal moorlands discussed in a previous section.

In Wales we thus have the Neolithic type highly characteristic of the southward sloping moorland hills of Glamorgan, whence it has spread in modern times into what have become the coal valleys. This purest example of the Neolithic type (1 (a)–1 (b)) has survived, perhaps, mainly because of the isolation of the district with the Forest of Dean and, in earlier times, the general forest-and-swamp of the Severn basin. The district was also isolated from the Bristol Channel by the forested portions of the Vale of Glamorgan. This isolation is not assumed to have continued far into historic times.

It is natural that valleys of the moorland farther west show traces of the

¹ Beddoe, J., *Races of Britain*, 1885, p. 251.

oldest waves of Neolithic immigration, *i.e.*, of Neolithic types with perhaps Palæolithic admixture (1 (*a*) to 1 (*d*) and a few of 1 (*e*)).

The same point may also be made with reference to the moorlands of North Wales (especially 1 (*c*)), which are often fairly small and isolated, though the Mynydd Hiraethog must have offered reasonable space for the life of early times.

The abundance of moorland in Wales has brought about a general scattering of the Neolithic type throughout the country, especially in view of the fact that the moorland valleys with their limited opportunities have been exporting men for ages.

The Welsh coasts have seen so much immigration that one cannot now trace local concentrations of the Neolithic types corresponding with coastal and Netherland areas formerly occupied by them there. The point is one, however, to be borne in mind in any detailed human survey of a county like Pembrokeshire, where some rather poor-soiled or isolated patches near the shore might show such concentrations, just as some patches of poor sandy soil near the Chalk Downs show them though the Downs above have been a highway of invasion, immigration, and commerce during very many centuries.

In order to follow further changes we should picture a Britain in which the Downs of the south country had a certain leadership with their centre at the great cross-roads whence ways radiated along South Downs, North Downs, White Horse Hills, Mendips, and Blackdown Hills (Fig. 6). From the two latter, ways lead on respectively to the Cotswolds, and Northampton and Leicester, via the Chiltern Edge to the Chalk Edge of East Anglia, and via South Exmoor to Devon and Cornwall. Ways across the Midlands were few and difficult, but it was possible to work across either via the Longmynd to Wales or via the north side of the Trent valley to the Pennines.

Another way into Wales would be across the Bristol Channel from the Mendip district to the Barry district, but this would involve a sea crossing.

The subject of early centres of population in Britain is discussed in geographical detail in another article,¹ to which reference may be made. It might be assumed that, at the latest, the separation of Britain from the Continent occurred in Neolithic times. By the end of that period it would seem that sea communications were becoming important. In studying early movements by sea in the British region, with its cloudy skies and changeable weather, it is well to remember that it was then a risky proceeding to sail out of sight of land, save under special conditions of weather and experience. The Channel crossings are interestingly studied by Belloc² from this point of view and he shows that, in addition to the Straits of Dover, the crossing from Barfleur to St. Catherine's Point and thence to other points of the south coast of Britain was feasible and useful. Under special conditions a crossing even farther west might be attempted,

¹ Fleure, H. J., and Whitehouse, W. E., "The Early Distribution and Valleyward Movement of Population in S. Britain," *Archæologia Cambrensis*, 1916, p. 101.

² Belloc, H., *The Old Road*, 1911, pp. 66-7.

e.g., between Cornwall and Brittany, but there would be the one farther in to fall back upon in case of need. Documents from the Middle Ages testify to the importance of the roadstead of Saint Pierre Port in Guernsey for commerce between England and Aquitaine, showing clearly enough that, in spite of rocks and currents, ships then still hugged the coasts. *A fortiori* would they do this in the remote times of the beginning of maritime communications. The Straits of Dover crossing would not have had its present paramount importance in early times, as the north of France then no doubt had a great extent of forest, which partially blocked the roads to the sea. Peake¹ also discusses Channel crossings in this sense.

Archaeological Distributions and Early Commerce (see Fig. 7).

It is generally believed that towards the end of the Neolithic Age there was a considerable amount of movement and of intercourse affecting Britain; but in connection with these movements many problems still remain unsolved, though Abercromby, Crawford, and Peake have made distinct contributions to our knowledge concerning them, while both Coffey in Ireland and Déchelette in France have thrown light on the subject from outside.

Crawford² draws attention to artefacts of greenstone found at Breamore and Beaulieu in Hampshire, and mentions that Sir John Evans³ found one in Guernsey. The greenstone is from Brittany in all probability, so that here we have evidence of intercourse more or less along our western line (Cotentin-Hampshire, etc.) and evidence which may date back beyond the days of metal.

Abercromby⁴ says that about 2000 B.C. Britain was invaded by a rugged enterprising Alpine people who lived 300–400 years before, somewhere not very far north of Helvetia. Probably they had followed the Rhine and the coast till they came in sight of Britain. They were characterized by their "Beaker" pottery. They landed without metal, but they soon acquired it. They were mainly pastoral, but they were acquainted with wheat. Their landing was in Kent; they clustered upon the open Wiltshire downs around Stonehenge, thence advancing to the headwaters of the Nen (Northamptonshire heights) and to the Derbyshire Peak (1880 B.C.). It is noted for future discussion that Abercromby finds that they left the west alone, going to Devon, but not to Cornwall before about 1500 B.C. at least. Later on there is evidence from Cornwall in broad-handled pottery of the direct influence of Armorica. Abercromby suggests extreme moistness of climate as a reason for neglect of the far west, but we are tempted to ask whether it was not already occupied by other people. We see, at any rate, that Abercromby

¹ Peake, H. J. E., *Memorials of Old Leicestershire*, 1911, pp. 34–41.

² Crawford, O. G. S., "Prehistoric Trade between England and France," *L'Anthropologie*, 1913, p. 641.

³ Evans, Sir John, *Ancient Stone Implements*, second edition, 1897, p. 107.

⁴ Abercromby, Hon. John, *Bronze Age Pottery*, 1912, p. 110.

recognizes two routes from the Continent to Britain: one from Armorica to South-west Britain, the other across the Straits of Dover region.

Crawford¹ also has studied Beakers and has formed the opinion that the Beaker Makers came from Germany (Elbe as well as Rhine) and settled or penetrated at various places on the coast from Moray Firth southwards to Dorsetshire. He thinks they probably came without a knowledge of metal, but that this soon followed them and he notes that in Britain, but not in Ireland, beaker areas are usually also places where flat celts are found. Ireland has abundant flat celts but no beakers, or only a few doubtful ones.

Peake² emphasizes the movement of people across the North Sea at the close of the Neolithic period, and elsewhere³ states his belief that the Beaker people landed without metal, a belief which Mr. R. A. Smith⁴ shares. Peake⁵ also believes that it was the lure of Irish gold which drew these people across Britain, and he sketches out some of their routes.

Crawford⁶ notes the association of two gold lunulæ with a flat celt of early type in a find in Cornwall.

These views as to Irish gold are not universally accepted, but it seems difficult to find an alternative hypothesis, and even a provisional theory is valuable if lightly held. The lure of Ireland is illustrated in another way. The country most famous for dolmens (Fig. 7) is France and they occur along a line from the Narbonne region along the western edge of the Massif Central to Brittany and Le Cotentin. They are also found around the Iberian peninsula and in North Africa. There is probably reason to expect new information concerning their occurrence in the Balkans and Ægean, and while not necessarily accepting Elliot Smith's⁷ view of their origin from the Egyptian Mastaba, we may provisionally think of their spread from the Mediterranean region. They would have spread thence eastward through Syria to India, northwards through Europe to North Germany and South Sweden, and westward via France as above stated to—

- (a) South-west England⁸—Cornwall, Devon, Somerset with outlying representatives in Wilts and a strong group near Aylesford in Kent.
- (b) South and south-west coasts of Wales⁹—near Barry, in the Gower Peninsula, along lines across Pembrokeshire and in quantities along its coast north of St. David's (Pencaer, etc.).
- (c) Here and there on the coasts of Cardigan Bay.

¹ Crawford, O. G. S., "Distribution of Early Bronze Age Settlements in Britain," *Geographical Journal*, xl, 1912, pp. 184 ff.

² Peake, H. J. E., *Memorials of Old Leicestershire*, 1911, p. 37.

³ Discussion after No. 1, *op. cit.*, p. 200.

⁴ Discussion after No. 1, *op. cit.*, p. 199.

⁵ *ibid.*, p. 200.

⁶ *op. cit.*, p. 202.

⁷ Elliot Smith, G., *Report Brit. Assoc.*, 1913, p. 646.

⁸ Windle, B. C. A., *Remains of the Prehistoric Age in England*.

⁹ See Bibliography in Fleure, H. J., "Archæological Problems of the West Coast of Britain," *Archæologia Cambrensis*, 1915, p. 405.

- (d) In numbers in Anglesey and on some parts of the Carnarvonshire Coast, and indeed along some apparent cross lines.
- (e) Ireland, where the dolmens are exceedingly numerous.

Beyond Ireland they are no longer found, save at St. Kilda.¹ It would seem that, practically, Ireland is the end, and this, whether we regard all the Irish dolmens as due to influence coming along the Brittany-South-west England route or whether we imagine that while some may illustrate that influence others reflect the movements from Germanic lands across to Ireland. Certain detailed resemblances suggest the latter view, but, on the other hand, dolmens are conspicuously absent from Eastern Britain, and beakers, it must be remembered, are rare in Ireland. The probability is that the route via Brittany and Le Cotentin was at first the important one as far as Ireland was concerned. Borlase² emphasizes the similarity between the dolmens of the Lands End district and certain Irish ones and also resemblances between Irish specimens and those of North Germany and South Sweden.

Déchelette³ discusses characteristics of the sculpturings at New Grange and reaches conclusions which Coffey had in part reached beforehand. Though they may refer to intercourse later than that just discussed they are of interest here.

“De l'Irlande la spirale gravée a certainement cheminé jusqu'à Gavr'inis (in Brittany), où elle apparait comme une importation étrangère, absolument inconnue ailleurs dans toute la Gaule occidentale. La Scandinavie, de son côté, avait reçu la spirale de l'Europe du sud, à la seconde phase de son âge de bronze. On ne peut plus songer à la faire venir de l'Irlande et en Scandinavie par la côte de l'Atlantique puisqu'il est bien acquis qu'elle fait défaut dans la péninsule ibérique et sur les côtes françaises de l'Atlantique jusqu'à Gavr'inis.

“Il faut conclure de là, qu'elle a pénétré dans l'Europe du Nord par la voie terrestre de l'ambre. Ainsi les sculptures des mégalithes irlandais sont, en définitive, le produit de deux courants méridionaux aboutissant au même point: le plus ancien, d'époque néolithique, a porté en Espagne, en Gaule (principalement dans la partie occidentale) et dans les Iles britanniques, les dérivés de l'idole égéenne. L'autre un peu plus récent, et correspondant à la seconde phase de l'âge du bronze scandinave, a introduit au nord de l'Europe les spirales et les symbols solaires.

“Les mégalithes irlandais qui révèlent l'empreinte de cette double influence sont donc nécessairement les plus récents.”

¹ Boyle Somerville, Capt., “Prehistoric Monuments in the Outer Hebrides,” *Journ. Roy. Anthropol. Inst.*, 1912, pp. 46 ff.

² Borlase, W. C., *Dolmens of Ireland*, 1897, pp. 439 ff.

³ Déchelette, J., “Nouvelle Interprétation des Gravures de New Grange et de Gavr'inis,” *L'Anthropologie*, 1912, p. 43.

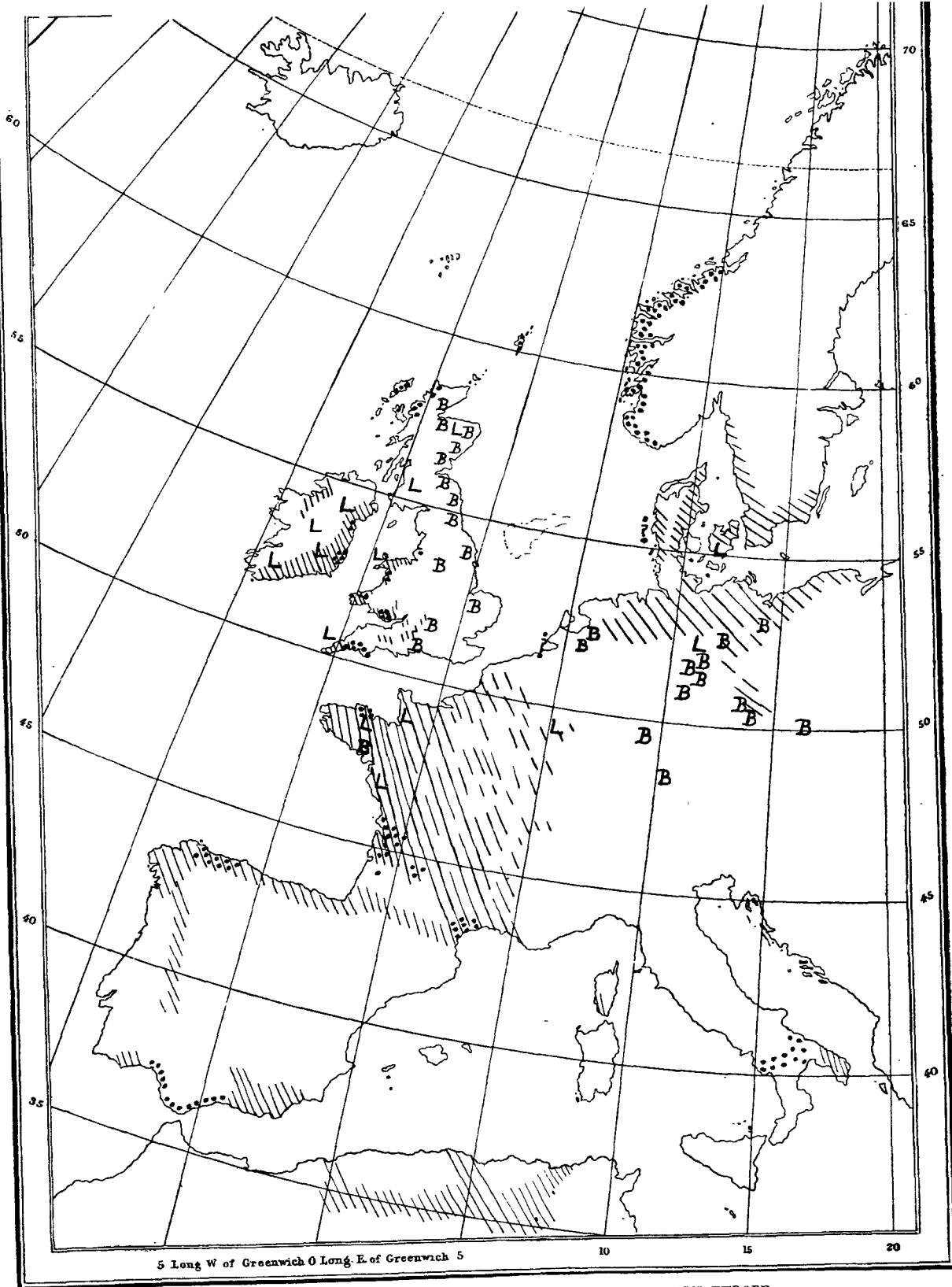


FIG. 7.—TENTATIVE MAP OF SOME DISTRIBUTIONS IN WESTERN EUROPE.

Oblique lines indicate Dolmens. The mapping is based upon Fergusson as regards Africa, Spain, Germany and Scandinavia, upon Déchelette (1912) as regards France and Italy, and upon various authorities as regards the British Isles. Dots indicate the presence of broad-headed dark men as a characteristic element of local population. L indicates finding of lunule (after Coffey). B indicates presence of beakers (after Crawford), apparently associated with intercourse across the North Sea but not with coasting intercourse from the Mediterranean.

It should be said that the above represents a considerable modification of the views Déchelette expressed in his *Manuel d'Archéologie* (t. i., p. 614, note 2, cft. II, i, p. 498), and the modification is largely due to Coffey's work.¹ The point now reached is that two lines of intercourse and influence from the Mediterranean converged on Ireland as apparently for a while their ultimate end (Fig. 7).

- (1) A coasting route, with probable cross-peninsular abbreviations, from the Straits of Gibraltar to Le Cotentin and thence across the English Channel to South-west England, and so up the Irish Sea and its coast lands. This route, according to Déchelette (save that he does not go into the questions relating to the British part of it), was in existence before the close of the Neolithic period. In speaking of the ornamental stone, Callais, he says² that it was used towards the end of the Stone Age, and 450 beads have been found in the dolmens of Le Morbihan; one bead has come from the Loire Inférieure, others from Portugal, Hautes Pyrénées, and Provence. This, so far as it goes, indicates a coastwise exchange and distribution.
- (2) The Amber Route across Central Europe to North Germany and Scandinavia and thence, probably, across Britain.

Whether the lure of Irish gold was or was not the factor that drew people to Ireland, it is interesting and important to know of the finds of Irish gold, for they illustrate the two lines of intercourse specially well (Fig. 7). Coffey³ gives the best list of gold lunulæ, supposed to be of the Irish Bronze Age:—

62 have been found in Ireland.

1 was found at Llanllyfni, Carnarvonshire, *i.e.*, on one of the western peninsular projections of Wales.

4 were found in Cornwall, 2 near Padstow, a port from time immemorial and, one may add, well known in connection with pilgrim traffic, 1 near Penzance, and 1 near Lesnewth.

3 were found in Le Cotentin (Tourlaville, Valognes and Montebourg).

1 was found in Côtes du Nord.

2 were found in La Vendée, south of the Loire.

All these suggest our western coasting route.

In addition, Lanarkshire has yielded 2, Dumfries 1, and Elgin 1; 1 was found in Luxembourg, 1 in Hanover, and 2 in Denmark. These suggest the cross-British routes mentioned in connection with the Beaker Makers. Peake⁴ discusses the route across England in some detail in correlation with other finds. Coffey⁵

¹ Coffey, G., *New Grange and other Incised Tumuli in Ireland*, 1912; *Bronze Age in Ireland*, 1913.

² Déchelette, J., *Manuel d'Archéologie*, t. i, p. 626.

³ Coffey, G., *Bronze Age in Ireland*, 1913.

⁴ Peake, H. J. E., *Memorials of Old Leicestershire*, 1911.

⁵ Coffey, G., *Bronze Age in Ireland*, 1913.

also instances the gold sun-discs of Ireland as further evidences of connection between Ireland and Scandinavia in the Bronze Age, while Déchelette was quoted above with reference to the spiral.

Allowing that lunulæ (*vide* Cornwall find) belong to the Early Bronze Age and, perhaps, that dolmens are even older, we hold the view that the cross-British route began early and lasted on through the second phase of the Scandinavian Bronze Age. Déchelette¹ makes an interesting reference to the Far West in his discussion of the Early Iron Age. He says that:—"Ces régions, la Grande Bretagne, le nord de la Péninsule Ibérique et la Gaule Armorique, c'est-à-dire les marchés et les entrepôts de l'étain aient lutté contre l'introduction du fer. En effet la première phase de l'époque de Halstatt n'est aucunement représentée dans toute la Gaule occidentale. La seconde, celle de poignards à antenne, a laissé des vestiges très nombreux dans la Gaule du sud-ouest et seulement des traces très clairsémées en Armorique. Dans l'état actuel des découvertes c'est seulement à l'époque de la Tène que cette dernière région apparaît comme définitivement acquise à l'industrie du fer."

This view is most interesting, for it suggests the separateness of the life of our west-coast route and the long local duration of Bronze Age conditions, giving opportunities for many developments of movement, of trade and of fashion. A summary of a few of these follows here:—

Crawford² draws attention to the distribution of flat celts along a line from North Wales to Christchurch on the Hants coast, while three celts have been found at Weymouth and one at Southampton—these are three likely ports for ancient trade. This line is related to our west-coast route.

Following Peake, he also traces another line from Warrington via the Peak District to Peterborough, then, perhaps, a port on what are now the Fens. This line is one of the cross-British series. One of Crawford's points is a difficulty with our hypothesis, and a difficulty we should not wish to slur over; flat celts, he says, are rare in Devon and Cornwall; we cannot but think that the gaps in his maps will be filled up as the records on which the maps are founded become more complete.

Munro³ notices various distributions along the Scottish portion of the west-coast route. Beehive huts are found in Harris and Lewis and the outer Hebrides, Skye, Mull, etc. Chambered cairns occur in Argyll, Inverness, Sutherland, Caithness, and on to the Orkneys, but they do not exist in sufficient numbers elsewhere to entitle them to be regarded as the representatives of the Stone Age burials of Scotland. Brochs occur to the number of 400 on the shores and straths of Caithness, Sutherland, Ross, Inverness, Argyll, and also Orkney and Shetland, while outside this region only 7 are known (Forfar 2, Perth 1, Stirling 1, Midlothian 1, Selkirk 1, Berwick 1).

¹ Déchelette, J., *Manuel*, 1913, t. ii, p. 552.

² Crawford, O. G. S., *Geographical Journal*, xl, 1912, pp. 184 ff. and 304 ff.

³ Munro, R., *Prehistoric Scotland*, 1899, pp. 326, 338-40, 389.

There are ruined "towns" with huts, etc., built of big stones, sometimes almost megalithic, at various spots along the west coast of Wales (Ty Mawr, Holyhead; Tre'r Ceiri, Llyn; Garnfawr, Pencaer, N. Pem.; Foel Trigarn, Prescelly; St. David's Head, Carn Goch, etc.), while a related type is found on the hill sloping up to the Carneddau Hengwm on the Merionethshire coast, and smaller traces occur elsewhere also (Fig. 8). In almost every case these hut-towns have dolmens near them, and the association is probably more than accidental in view of the almost megalithic nature of the huts in some places. If it were not for this association, we should be tempted to link together these Welsh examples with those of the Scottish coasts.

Lewis¹ notices there is a West Scottish type of stone circle in addition to an Aberdeen type and an Inverness type. He also says that in South Britain it is only in Cumberland, Devon and Cornwall that there can be said to be groups of stone circles. There are circles in Wales distributed less exclusively near the coasts than the dolmens. Here, therefore, is another type of stone monument, this time of very problematic age, distributed along the west coast.

Coffey² believes that Iberian influence is discernible in some of the later types of bronze implements, such as double-looped palstaves; these palstaves have also been found in France and in South-west England. Anvils³ of bronze are well known among French finds, but only one has been found in the British Isles, and that was in Ireland. Here again, therefore, we get a glimpse of Bronze Age intercourse along the west-coast route.

The general conclusion which may, perhaps, be drawn, for the present, from this archæological review is that coasting trade probably developed considerably towards the end of the Neolithic Age and spread around Spain and thence to Western France and Le Cotentin, whence across to the Isle of Wight and Hampshire and so on, speedily finding its goal for some reason or other, perhaps the presence of gold, in Ireland. Along this way Ægean influences reached West Britain and Ireland.⁴ This line of intercourse was maintained for a long time, probably owing to the tin found in Brittany and the British Isles, and its "life" lasted on for a while after the Early Iron Age had begun in Central Europe. Whether the connection with the Ægean lasted on or not one cannot say, but probably with the coming of iron in that region it diminished, and what had formerly been the western end of a line of Ægean trade became a line of intercourse more or less independent of the Ægean. Perhaps the line from Brittany to Narbonne developed as a cross-peninsular route at an early stage of the coasting

¹ Lewis, A. L., "Stone Circles of Scotland," *Journ. Roy. Anthropol. Inst.*, 1900, p. 56.

² Coffey, G., *Bronze Age in Ireland*, 1913, p. 27.

³ *Idem*, pp. 27-28.

⁴ One might be inclined to think that the legendary importance of Brut the Trojan in Western Britain has a foundation of fact in connection with these movements, but it is important to remember, as against this, the likelihood that it was introduced into British story by monkish scribes naturally influenced by Virgil's setting of the legends of Rome, the mistress of the civilization the monks were concerned to spread.

intercourse—it may have been a line of movement of peoples long before this. (See p. 121.)

At some period, after the dolmen fashion had almost died out, one imagines this line of intercourse was extended northwards to the Hebrides, West Scotland, the Orkneys and Shetlands, and, as we shall see shortly, perhaps even to Norway.

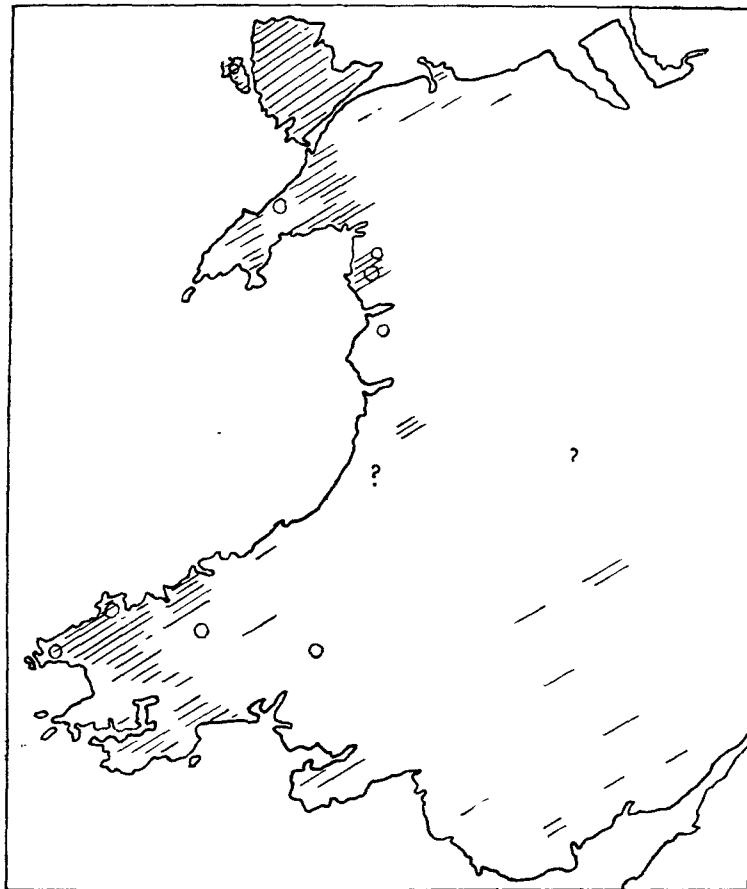


FIG. 8.—DOLMEN AREAS IN WALES INDICATED BY OBLIQUE LINES, DRY-WALLED FORTRESS TOWNS BY CIRCLES.

The question marks refer to problematic dolmens.

The Beaker Makers.

At the end of the Neolithic period likewise came the Beaker Makers, formerly described as the Bronze Age race, across the North Sea, and they settled on the eastern side of the island, it would appear, putting out feelers, probably towards Ireland, but not reaching it in any numbers. Evidence is to hand of intercourse and trade along these cross-British routes, but we shall hazard the hypothesis that probably the western coastal zone (Irish Sea coast, etc.) was held by immigrants who may have come along the other route, so that the Beaker Makers found possi-

bilities of trade and not of settlement to any great extent. Flat celts¹ are abundant in Ireland; beakers, which are evidences of settlement, are hardly found at all. Britain was still forested very heavily, no doubt, and the immigrants on the east would find westward penetration through the forests difficult for anything more than small trading groups.

With the beakers have long been associated the broad-headed, strong-browed type, long known to archaeologists as the Bronze Age race, but better called the "Beaker Makers," or Borreby type, for we now think that these people reached Britain without a knowledge of bronze. The fact that Greenwell² and Rolleston discuss this type from several examples belonging to East Britain is further evidence in support of the view that these Beaker Makers came over across the North Sea.

The general description of them is that they must have been taller than the Neolithic British, averaging 5 feet 7 inches, rather strongly built, with long forearms and inclined to roughness of feature. The head was broad (skull index usually over 80, often 82 or more) and the supraciliary arches strong, but very distinctly separated in most cases by a median depression, and thus strongly contrasted with the continuous supraciliary ridges of, *e.g.*, Neanderthal man. The marked ridges often gave an appearance of savagery, which, however, was quite absent from the fine, yet very strong, Cowlam skull.³

Keith⁴ has discussed their possible survivors at the present day, and Beddoe⁵ did so before him. Beddoe noted the tendency to an aquiline nose in the type and found it among the Cumbrian dales. Keith notes the occurrence of the Beaker Maker type among some intellectual families, and instances the Darwins; there are probably several others. He thinks it was usually brown to fair in colouring at all periods, and this seems to be a very general opinion. Probably broad heads form a considerable portion of the present population of East Britain, and they are, perhaps, mostly fair, but their relationship to this particular type is by no means clear; we believe that there were "fair broad-heads" in most invasions down to Anglo-Saxon times. The marked characters noted above, at any rate, are not often found in East Britain, and it is broadly true that the race of the Beaker Makers has been swamped by others.

It may have penetrated into Wales, but, in the region of the larger plateau of South Wales it would be swamped, if anywhere. In the north, however, in the Bala Cleft of Merionethshire, we have noted a remarkable broad-headed, aquiline-nosed type with colouring brown to fair, and we provisionally connect this type, found in the Bala Cleft, where Neolithic types are scarce, with the Beaker Makers.

¹ See Peake, H. J. E., *Memorials of Old Leicestershire*, 1911, and Crawford, O. G. S., *Geographical Journal*, 1912, xl, pp. 184 ff.

² Greenwell, W., and Rolleston, G., *British Barrows*, 1877, *passim* (see also Parsons, F. G. *Journ. Roy. Anthropol. Inst.*, xliii, 1913, p. 550).

³ *ibid.*, pp. 586-7.

⁴ Keith, A., *Journ. Roy. Anthropol. Inst.*, xlv, 1915, p. 16.

⁵ Beddoe, J., *Races of Britain*, 1885, p. 250.

We cannot presume to guess when it was that these people (2 (c) in list) reached the Bala Cleft. They may be Bronze Age invaders (we know nothing appreciable of beakers here), coming probably rather late, because land ways into North Wales were very poor, while the lowlands were still almost impassable. They may be the result of some later invasion, or of trading settlers along this permanent line of movement.¹ They may even be connected with movements in historic or proto-historic times, such as the invasion of Cunedda. Whenever they came, their type is at least fairly clear, and, as usual, it is associated with independence of criticism and general intellectual and administrative power. The type should be looked for more in detail in Breconshire. It has not as yet been noticed there, except sporadically, and it is certainly not native to the valley of the Severn; these are the main "fair" regions of inland Wales. We think the type should be provisionally discussed as an Alpine-Northern cross evolved somewhere in Central Europe.²

The dark broad-headed type.

The western coasting route has not yet received sufficient attention, and ours is, so far as we know, the first attempt to associate a human type with it (No. 4 in list). We found our dark, stalwart, broad-headed men on certain coastal patches, often curiously associated with megaliths in Wales, and thence we set out to find the archaeological correlations above mentioned. The fact that they connect West Britain and Ireland with the Mediterranean in the Bronze Age, and even, perhaps, before it began, is interesting in connection with what we have found concerning these stalwart, dark, broad-headed people, who do not show the brow-ridges of the other broadheads just discussed. (Fig. 7.)

We believe these dark broad-headed people occur on patches of rural coast, usually cliff-coast, in Wales as follows:—

The region of Llantwit Major—*i.e.*, the south side of the Vale of Glamorgan.

The south-west of Carmarthenshire.

Pencaer district in North Pembrokeshire.

The above districts are given from personal observation without many measurements or analyses.

Newquay, Cardiganshire (see pp. 78–79).

Ardudwy coast, Merionethshire (see pp. 88–97).

¹ It may be worth while to suggest that the hills and chases of the western Midlands offered an upland line of communication to near the Bala Cleft which cannot have been densely forested. From a branch of that cleft, through the Rhinog Mountains, have been built the "Roman Steps," which are quite possibly a Bronze Age trade route. They end, seawards, in the dolmen-country of Ardudwy. It is conceivable that this may have been a line of westward penetration of the Beaker Makers which attained to contact with the life of the west coast.

² But see von Luschan, F., "Early Inhabitants of W. Asia," *Journ. Roy. Anthropol. Inst.*, xli, 1911, pp. 221–244.

The above districts are given as a result of detailed analysis.

The Carnarvonshire coast.

This is given from some analysis supplemented by personal observation.

We have found the type in considerable numbers on the east coast of Ireland, round about Wicklow, but we do not think it is at all characteristic of the hill country behind the coast up towards Glendalough. On these points, however, much more work is needed. We think the type also characteristic of the Boyne, but we have only preliminary observations—we are more certain as regards Wicklow. The type is thus found on both sides of the Irish Sea—*i.e.*, in Wales and in Ireland.

Our friend, Mr. C. L. Walton, from his personal observation, assured us long ago of the presence of this type in South Devon and probably in Cornwall.

Ripley,¹ following Collignon,² shows that the coastal people of the gulf of Saint Brieuc, and especially the Iceland fishers, are more broad-headed than their neighbours, and from personal observation it may be stated that the type approaches that at present under discussion.

Around Narbonne also broad heads and dark hair are very noticeable. We thus have the stalwart "dark-broad" type at both ends of the "dolmen line." It might be identified, perhaps, along the line as well, but care would have to be taken to discriminate, if that is possible, between it and the less strongly built, but equally broad-headed Alpine stock, which is so important a feature of Central France.

Oloriz³ shows that broad-headedness is exceptional in the Iberian peninsula, but is found in two places. In the north-west it occurs in Asturias and around Oviedo. In the extreme south it is characteristic of the Andalusian coast from Motril to Moguer, with the exception of the city of Cadiz. In the latter case it does not extend far inland, and as a consequence it does not do much to increase the general average of cephalic indices for Andalusia.

Ripley⁴ says that the gulf of Salerno has a broad-headed population, which he seems to account for as a sea-borne colony, and he also has a photo of a dark broad-head from Ischia. The maps he gives indicate dark-colouring and breadth of head as characteristics of Salerno and the country across Italy, past the head of the gulf of Taranto to the region of Bari, on the Adriatic.

These distributions, the more interesting because they are the work of several observers quite unknown to one another and without any theory to prove, show that there is considerable reason to imagine a coastal series of settlements of dark broad-heads, stretching at least from South Italy to Ireland, perhaps both, via the Straits of Gibraltar and across France by the dolmen line.

¹ Ripley, W. Z., *Races of Europe*, 1899, p. 151.

² Collignon, R., *Bull. Soc. d'Anthropologie*, Paris, 1890, pp. 736–805.

³ Oloriz, "Distribucion geografica del Indice cephalica," *Boletin Sociedad Geografica de Madrid*, xxxvi, 1894.

⁴ Ripley, W. Z., *Races of Europe*, 1899, ch. x, pp. 246 ff.

Questions naturally arise as to the homologies of this type, and its distribution beyond the line here mentioned. If we had the type in Britain, by itself, we should be inclined to connect it with the general population of Central Europe, the dark, broad-headed Alpine type. We should, however, retain a little hesitation about this, as our type is sometimes of extraordinary strength of build and, while often fairly short, it is occasionally outstandingly tall; moreover, the hair is frequently quite black, and this is not on the whole an Alpine character. But, when we note the coastal distribution of this type, our hesitation is much increased, for the Alpine type has spread typically along the mountain flanks and its characteristic rarity in Britain is evidence of how little it has followed the sea.

We cannot but wonder also whether what Deniker calls the Atlanto-Mediterranean type is not a result of averaging these dark broads with the true Mediterranean type.

Seeking further distributional evidence, we find that dark broad-heads are highly characteristic of Dalmatia and may be an old-established stock, but it would appear that this region is famous for the height of the heads there, and our type is not specially high-headed. Broad-headed brunets¹ do, however, occur farther east in Asia Minor, the Ægean, and Crete, for example. Many are certainly hypsicephalic, but in others it seems that the brow and head are moderate and the forehead rather rectangular, as in our type.

We may thus tentatively picture a movement, perhaps of early traders from the eastern Mediterranean, prospecting as they went west, and making settlements here and there, notably at critical points like the Straits of Gibraltar and on the coasts of peninsular projections like Brittany, South-west England, South-west and North-west Wales. One is, of course, tempted to think that the coincidences between the distribution of our type and that of dolmens, for example, are too great to be fortuitous, and one cannot but wonder whether the prospectors, reaching Ireland, did not find the gold which made Ireland famous in the Bronze Age. But these remain mere guesses for the present, though an interesting recent paper by Perry,² states the case for a close relationship between the geographical distribution of megalithic monuments and ancient mines.

It is interesting that there should be evidence of our dark broad-heads, beyond the Irish end of the line now discussed, the line of intercourse which Déchelette, as quoted above (p. 130), thinks must be older than the Bronze Age. The chief evidences for the type beyond Ireland (Fig. 7) are:—

- i. Ripley³ shows that a dark, broad-headed element is present in Shetland, West Caithness, and East Sutherland. This is sometimes called the Old Black Breed.

¹ Von Luschan, F., "Early Inhabitants W. Asia," *Journ. Roy. Anthropol. Inst.*, xli, 1911, pp. 221 ff.

² Perry, W. J., "Relationship between Geographical Distribution of Megalithic Monuments and Ancient Mines," *Mem. and Proc. Manchester Lit. and Phil. Soc.*, vol. 60, No. 1, 1915.

³ Ripley, W. Z., *Races of Europe*, 1899, p. 309.

- ii. Arbo¹ finds the coast and the external openings of the more southerly Norwegian fjords have a broad-headed population, whereas the inner ends of the fjords and the interior are more dolichocephalic. The broad-heads stretch from Trondhjemsfjord southward, and from their exclusively coastwise distribution he supposes them to have come across from the British Isles.

The population is darker than that of the rest of Norway and its area of distribution, as Dr. Stuart Mackintosh has kindly pointed out to us, is, like that of the same type in the British Isles, characterized by a pelagic climate.

We have noticed above that various archaeological objects are distributed along the Hebrides-Shetland extension of our west-coast route and some of them, like the dry-masonry constructions and the brochs, seem to belong, on the whole, to a period later than dolmens, etc., so we may have here a subsequent extension to South-west Norway. Be it noted that this is a region quite unconnected with that of the Scandinavian dolmens or gold trade or bronze finds, which are mostly from South Sweden and Denmark.

We note next, in order not to avoid difficulties, that Ripley² refers to a broad-headed type in Jutland which, however, he follows Dr. Beddoe³ in ascribing to the same stock as the Beaker Makers or so-called Bronze Age Race, from which we at present feel justified in dissociating our dark broad-heads. Beddoe⁴ also speaks of the broad-headedness of the people of Beveland, in Holland, who, he suggests, may be remnants of an ancient population driven into the low islands by the Batavi or by still earlier invaders. Ripley⁵ likewise speaks of the same type in Nord and Zuid Beveland, on the inner islands of the Rhine mouth, but notes that, along the outer coast, the fair more or less Nordic type spreads everywhere, as along the Litus Saxonicum generally. Ripley associates these people with the Alpine stock, and certainly the Walloons are not far off. Moreover, this distribution does not force one to think of these people spreading to Britain. On the whole, therefore, we are inclined to dissociate the Jutland and Beveland brachycephals from our dark broad-heads, and we do this the more readily because, so far as we know, dark broad-heads are not characteristic of the east coast of Britain, apart perhaps from recent immigrants in the cities. At the same time we would point out that if there is kinship in gold lunulæ, dolmens, etc., between Ireland and the North German plain, there is a possibility of our dark broad-heads having drifted across in either the one direction or the other, always provided that this type did come into Western Britain in the Bronze Age.

¹ Arbo, C. O. E., *Ymer*, Stockholm, 1900, p. 25.

² Ripley, W. Z., *loc. cit.*, pp. 211-12.

³ Beddoe, J., *Races of Britain*, 1885, p. 16; also Beddoe, J., *Anthrop. Hist. of Europe*, second edition, 1912, p. 141.

⁴ Beddoe, J., *Anthrop. Hist. of Europe*, 1912, p. 110.

⁵ Ripley, W. Z., *loc. cit.*, 1899, pp. 297-9

To sum up, towards the latter part of the Neolithic Age, influences and perhaps immigrants affected Britain and Ireland, coming from the south, perhaps around Spain, perhaps across France. At about the same time, other influences from the Rhine and the Low Countries, this time indubitably accompanied by immigrants, reached the British coasts. The latter immigrants survive in all probability in locations quite distinct for the most part from their primeval ones, localities where, so far as can be judged, there had been but slight opportunity for Neolithic settlement; perhaps it is for that reason that the later comers were not swamped by resurgence of the indigenous stock. The former immigrants, those from the south, on the other hand, came at some period as yet quite unfixed; a certain amount of similarity between their distribution and that of dolmens is suggestive but not conclusive. The fact, however, that they form an important part of a rural fisher-farmer population in nearly every case, and are not related to modern ports, indicates that they are an old-established population. Also, as the route indicated by the series of their locations is apparently the route followed by coasting trade of the Bronze Age (or rather late Neolithic—Early Iron Age, at least), one may imagine that these dark broad-heads came at some time during that period. Moreover, they would seem to have spread up to Shetland and Norway at some quite remote period.

It is quite probable that, when more archæological finds have been mapped, fresh correlations will appear, which may show that more waves of influence reached these islands during the Bronze Age, but at present little is known concerning local movements of peoples between the Early Bronze Age and the Early Iron Age.

Another possibility regarding the dark broad-heads is that they might be the "Black Danes" mentioned in some of the chronicles, but these terms were loosely used and give no indication of the place from which the sea rovers included under it had come. It is also possible, as Professor Boyd Dawkins has pointed out to us, that the term "black" might refer to the colour of their ships, or their garments, or might be otherwise adventitious. It is difficult to imagine that coastal communities in so many places with such multifarious evidence of long establishment are due to this type of invasion, and one may remember that there may have been enough dark broad-heads from Arbo's coastal zone in Norway (see above) to give ground for the term "Black Dane" without there having been enough to create all these settlements.

We have, further, to say on this subject that our dark broad-heads seem distinct from those found in Sussex, for example. These latter may be the result of immigration from Normandy, a view which we believe Dr. Beddoe held.

Parsons¹ has published a most interesting and valuable account of crania disinterred at Hythe. They are probably mediæval, and show an extraordinary number of broad-heads, with skull-breadth-index over 80, and cephalic index on

¹ Parsons, F. G., "Hythe Crania," *Journ. Roy. Anthropol. Inst.*, xxxviii, 1908, p. 419.

the living head, therefore, probably, 81·5 or more. In only a very few cases did the glabello-maximal length of those skulls reach or surpass 191 (equivalent to about 200 on the living head). The Hythe series is thus very different from any Welsh series of modern times, even in the regions such as Ardudwy, where broad-heads are comparatively common. Beddoe¹ refers to names, etc., on skulls in Hythe Ossuary as showing Norman-French immigration.

Parsons' Rothwell series² is of a more average character, but is still different from a Welsh group; the more extreme measurements seem better represented, while the broad-heads reach the proportion that they do only in some of the broadest-headed districts in Wales. They suggest the persistence of distinct stocks side by side.

We have no guide as to pigmentation of these mediæval people, and that stands in the way of closer comparison of Parsons' results with ours for the time being, though we hope it may be possible to define race types in increasing detail and thus to bring the two lines of work closer together.

The two broad-headed stocks whose distribution we have discussed seem to be connected, in part at least, with Bronze Age movements. In the one case, we judge that the type in question is a refined modification of the Beaker Maker type, well known from sepultures of the Bronze Age, but we do not know when it reached Merionethshire. In the other case, we imagine from coincidences of distribution that the type spread up the Atlantic coast as far as Ireland and Wales, somewhere between late Neolithic and perhaps post-Bronze-Age days, and, either then or afterwards, went on via the west of Scotland to Shetland and Norway. We judge this to be the case, because it was especially in Bronze times that this route was so important. The export of tin may even have died down by Roman times.³

Early Iron Age Movements.

Of Early Iron Age movements we know little from the point of view of physical anthropology, so any suggested correlations are strictly tentative.

It is generally agreed that iron did not reach Britain till the period of La Tène, and Rice Holmes⁴ gives a useful statement of the argument which tends to show that the Belgæ came two centuries or so before the Christian era and that they were, perhaps, preceded by other Brythonic-speaking as well as iron-using tribes, whose date may be about 400 B.C. These people are described as being tall and stalwart, with fair or red hair, and their civilization must have been of a high order, in some respects at least.

We cannot but recall that it was probably in the Early Iron Age that the lower Rhone valley became a highway (see p. 120). It thus suggests itself to us, as we believe it has to Peake, that, with their sharp iron tools, men were at that time

¹ Beddoe, J., *Races of Britain*, 1885, p. 256.

² Parsons, F. G., "Rothwell Crania," *Journ. Roy. Anthropol. Inst.*, xl, 1910, p. 483.

³ Holmes, T. Rice, *Ancient Britain*, 1907, pp. 251-2.

⁴ *op. cit.*, pp. 231-4.

effectually attacking the forest and so making a way from West Switzerland and Burgundy on the one hand, down through the forested Rhone valley to the Mediterranean, and, on the other through the forests of Northern Gaul towards Britain.

It is probable that this life of the Early Iron Age developed in East Britain while the old life and coastwise intercourse continued on the West, for we find the distinction of East and West persistent from the Bronze Age on to the present day. If, however, we are right in thinking that this period saw efforts to cut through the forest and to destroy it, we may think of the hillside roads of our country as beginning to develop, and we may also think of the Brythonic iron-using people as spreading along the valley sides, *e.g.*, from the East and Midlands, perhaps, via Severn and Wye into Wales. Holmes concludes, apparently with justification, that Cranbourne Chase was unaffected by the "Early Iron Age" before Roman times, and that Lancashire was also untouched (as regards its isolation, see also p. 126), so it is probable that Wales also was little affected by iron before the Roman day, unless the coastwise intercourse had brought it in, which is somewhat doubtful.

If, therefore, the Early Iron Age people of East Britain were the first speakers of Brythonic languages to reach Britain, it is quite possible that the Brythonic¹ languages did not reach Wales much before Roman times. That is, however, far more than it would be wise for us to assume, for we as yet can hardly make more than guesses about the earlier language. We suspect that it was a Celtic language, but cannot decide whether it was of a Gaelic¹ (Goidelic) type. The two groups of Celtic languages are, after all, neo-Celtic, and we must be wary in transferring their present differences back into pre-Roman times.

We are, on the whole, inclined to speculate that, perhaps through Roman pressure, perhaps earlier, Brythonized dwellers in what are now the English Midlands spread along the valleys towards Wales, using, naturally, the Severn and Wye.

All Wales speaks Brythonic dialects, and has done so for many centuries, no doubt, but the distribution of the dialects, according to Sir John Rhys and Sir D. Brynmor Jones, is most interesting. They² show that the Powysian dialect occupies the Severn and Wye basins for the most part, especially the former—at least where it has not been displaced by English. They also urge that it displaced an older dialect, Ordovician they call it in one place, though without emphasizing the name. This older dialect they find in the district around Bala, the Berwyn Mountains and the Dee—*i.e.*, in the wild moorlands of North Montgomeryshire and in the deep protected valleys over their high northern edge. They find it also in the north of Cardiganshire, around Aberystwyth, while Powysian has spread across

¹ The Brythonic group includes Welsh, Cornish, and Breton. The Gaelic group includes Erse, Manx and Highland Gaelic.

² Rhys, Sir John, and Brynmor Jones, Sir D., *The Welsh People*, 1900, p. 8 and ch. I generally.

the watershed from Caersws towards Machynlleth and thence into West Merioneth (Fig. 9).

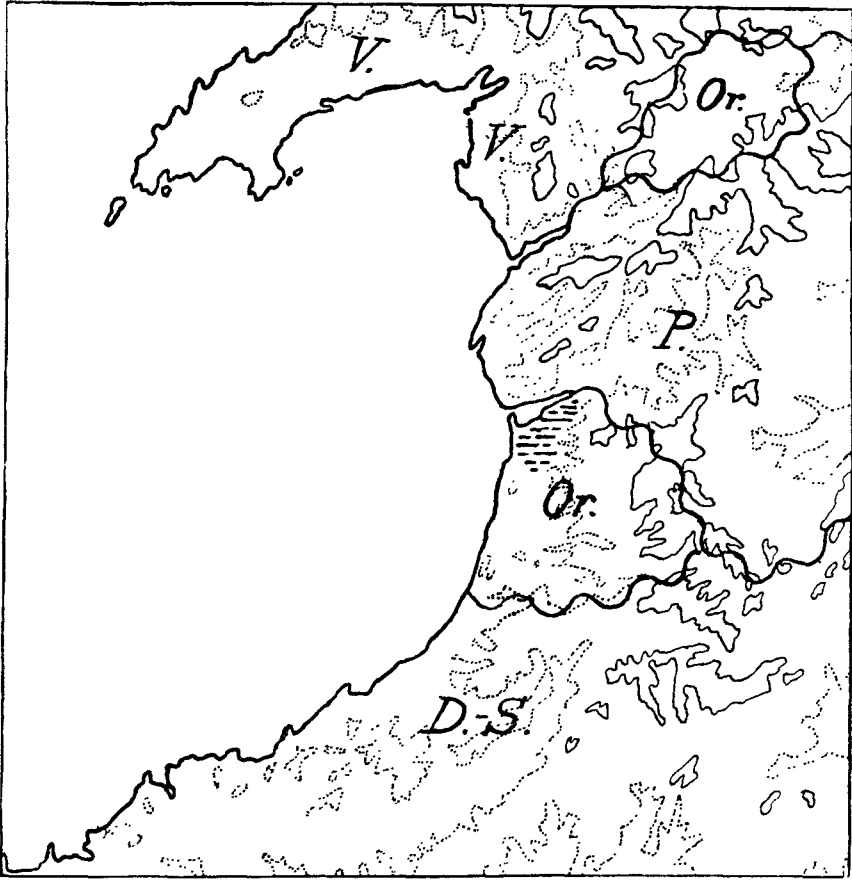


FIG. 9.—MAP ILLUSTRATING RHYS' AND BRYNMOR JONES' VIEW OF THE DISTRIBUTION OF DIALECTS OF WELSH.

V = Venedotian. Or. is what they have called Ordovician.
 P = Powysian.
 D-S = Demeto-Silurian.

The spread of dialect, of county administration, of styles in houses and furniture, etc., over that watershed to Machynlleth is an interesting detail of Welsh geography. The barrier of Borth Bog has usually stopped the further advance of Montgomeryshire, and south of it we are definitely in Cardiganshire. The Aberystwyth district, down to the River Wyre, however, keeps the dialect which Rhys thinks was pressed out of Montgomeryshire, perhaps through the Plynlymon passes as well as along Dyfi-side, by the advance of Powysian. The discontinuous distribution of the old dialect, if confirmed, suggests, like all such distributions, an earlier continuous one, and that implies its possession of much of what is now Powys.

If Rhys is right, there is thus evidence of advance of a dialect up the Severn and Wye valleys, but, as we have said before, all Welsh dialects are Brythonic, and it would be going too far to argue on this basis alone that Brythonic speech first advanced up that way, and found a Gaelic tongue in possession of the country.

Supposing, however, that the Early Iron Age¹ men were the first to use Brythonic in Britain, we may surmise that they and their speech did reach Wales at some time not very distant from the Roman invasions, and that they displaced or transformed older Celtic tongues in Gwynedd and Dinefawr, if they advanced via Powys. Distribution of place-names hints that at some time Brythonic folk gave the name of "Gwyddel" to people they met, and perhaps fought, in Gwynedd and Dinefawr. This implies some consciousness of a difference in speech, perhaps, but authors doubt whether the term means more than "foreigner."

It is of great interest that Edward Lhuyd argued long ago for the existence of a pre-Brythonic Celtic language in Britain from the occurrence of Asc, Esc, Isc, Ax, Ex, Ux, and so on in river-names. He derived these terms from Uisge, a word in the Gaelic languages for water, and a word which is never used in Welsh, Cornish, or Armorican. We thank our friend Mr. Richard Ellis, Meyrick Fellow of Jesus College, Oxford, for communicating this.

If the provisional hypothesis of the introduction of Brythonic with the Early Iron Age be allowed, the guess that the previous language was also Celtic is defensible. The Gaelic languages probably represent, in modified form no doubt, a Celtic more anciently insular than the Brythonic. With what we have suggested about coastwise intercourse along West Britain and the Irish shores in the locally long-drawn-out Bronze Age, it will also be agreed that the dialects on the two sides of the Irish Sea may have been akin, and it is Gwynedd and Dinefawr that are here concerned. (Note locations of dark broad-heads, of dolmens, of dry-walled fortresses.) In the old romances also it is Gwynedd and Dinefawr that are most concerned, and Ireland is often mentioned.

The simpler, more local, folk-tales refer in many cases to the contact between valley-people using iron and upland folk in a pre-iron stage of culture. There is as yet no authoritative collection of such tales, but a study of the place-names in a large number shows that they are mostly located in Gwynedd and Dinefawr, and that they gather especially around the smaller moorland sites (*e.g.*, in Carnarvonshire). This suggests (and the folk-tales repeatedly bear out the suggestion) that the upland folk on these small moorlands shrank away from the Iron Age invaders and made mystification a defence, as small communities have so often done elsewhere (*e.g.*, the Vaudois in their struggle with Piedmont).

¹ There is an absence of evidence on this point as regards any introduction of iron along our coastwise route, and an *a priori* improbability of its introduction along a route which was the conservative stronghold of the Bronze Age life. On the other hand, all evidence points to introduction of iron via south-east and east England, and the probability is that, coming from such a direction and being able for the first time in the human history of our region to use the valley sides seriously, it would advance into Wales via Powys. A Brythonic dialect would advance with it in that case, whatever the earlier language.

In the folk-tales, it is true, the people are called *fairies*, but colouring is mentioned only in one case—that of a trader from the sea who is said to be fair (*i.e.*, fair hair) is treated as something worthy of special mention. The fairy children (changelings) are always described in such a way as to suggest that they were dark and that they were the children of the Upland-folk of our hypothesis—*i.e.*, mostly of Mediterranean race. In the romances the princes and princesses are said to be fair, as though that were exceptional. Our friend, Mr. J. H. Shaxby, draws our attention to the probability that the word fair in “fairy” and “fair-folk” does not refer to physical traits, but is an adulatory term such as men so generally use in describing beings about whom their superstitions gather.

It is possible that, when Welsh folk-tales have been more completely collected and classified, the foregoing statements may be found to need adjustment. They are, in the main, a development of the late Sir John Rhys’ suggestions in his *Celtic Folk-lore*—a development due in large part to that increased correlation of human and archaeological studies which his public as well as his private work has done so much to encourage.

On the whole, it will be seen, we are at present inclined to think of a Brythonic advance into Wales—probably via Powys—at some time not remote from the Roman invasion of Britain. It may have been in waves pushing back old Celtic languages or dialects,¹ which were probably nearer to the Gaelic group than is Brythonic. That Wales and South-west England were mainly Brythonic in Roman times seems to be indicated by the fact that it was Brythonic that was taken to Armorica by immigrants from the West from 450 A.D. onwards.²

As regards physical type, we note a characteristic increase of the fair, medium-headed type (2 (*b*) and 2 (*a*)) as we descend the hills to get into the Severn basin or that of the Wye—*i.e.*, into Powys—and all through this region, and the Welsh border generally, there is a suggestion of dilution of pigment in the Neolithic or Mediterranean type. Whether the fair type may be correlated with the Brythonic invaders is doubtful: it may be due to later infiltration. On the other hand, however, Wales has for a long time been an exporter of men in the main, and it is not impossible that the present valley-folk may be in considerable measure the descendants of those who made these valleys human locations.

As we have spoken of language, we may be permitted to remark that it is perhaps not necessary to assume the Gaelic nature of the ancient Celtic all over Britain. The suggestions that have arisen in the course of our study of Bronze Age matters, however, make it possible, in our opinion, that with the coastwise

¹ Our friend and colleague, Mr. T. Gwynn Jones, M.A., tells us that in some ancient Welsh poems “Bryneich” is used in a general sense for enemies or strangers after having been used in a more special sense in earlier poems. The Erse use *Breathneich* for foreigner and give that name to Welsh people living in Ireland. Mr. Gwynn Jones’ suggestion is that Brythonic-speaking people may have got the term either by inheritance from Goidelic-speaking ancestors or by borrowing it from neighbours in Wales, who spoke a dialect akin to Goidelic. We wish to thank Mr. Gwynn Jones for this suggestion and for much help.

² Loth, J., *L’Emigration bretonne en Armorique*, Rennes, 1883, *passim*.

intercourse so often mentioned may have been associated, on both sides of the Irish Sea, an ancient Celtic which may have been in some sense the precursor of the Gaelic tongues. In other words, we do not feel bound to assume that the Gaelic languages proper were ever spoken in the eastern part of Britain, nor do we feel bound to accept the Zimmer view that they were not spoken in the west. Anthropology and Archæology both insist that there are other waves besides those from east to west. Zimmer¹ and Kuno Meyer go much farther and say that Gaelic languages spread from Gaul to Ireland direct and that they were not used in South Britain before Roman times. In this respect their view conflicts with that of Lhuyd and Rhys. We have mentioned this controversy with reluctance, but in the hope that thoughts suggested by anthropological and archæological work may be of some use to linguists and that their counter-suggestions may shed new light on our still unsolved problems. Zimmer² also urges the existence of direct trade relations between West Gaul (Loire and Garonne) and Ireland in the first century A.D. and the last century B.C. as well as later on.

Reverting to physical types of men, we think that the fair-haired, light-eyed men of the Severn and Wye valleys often have medium to broad heads (2 (b)), and that many men in Eastern England also show these characters. It is probably difficult to tell Brythonic types of pre-Roman times from Anglo-Saxon types of post-Roman times, and we are inclined to believe that in both these regions we may have contributions from both these movements of peoples, *i.e.*, it is not safe to assume that a fair man in East England is necessarily a representative of the post-Roman invaders and of "Teutonic" stock. He may be a Brython, and it is doubtful whether it will ever be possible to separate these two elements satisfactorily, though we may conjecture that long-headedness was more common among the post-Roman invaders than among the pre-Roman ones.³ There is at least a possibility that pre-Roman peoples are fairly well represented even in East England, and, if this be so, we need to consider how then the great contrasts between England and Wales have come to pass.

Before discussing this problem, however, it is necessary to mention that we probably have evidences of late-Roman and post-Roman movements in Wales which perhaps affected the population in certain areas.

Notes on Later Movements.

It is generally accepted that the northern and western parts of Britain, retaining their Neolithic population with some Bronze Age admixture, and receiving

¹ Zimmer, H., and Kuno Meyer, "Auf welchem Wege kamen die Goidelen vom Kontinent nach Irland," *Abhandl. königl. Preuss. Akad. der Wissenschaften*, 1912.

² Zimmer, H., "Ueber Handelsverbindungen Westgalliens mit Irland," *Sitzungsberichte der k. Preussischen Akad. der Wiss.*, 1909, p. 377; 1910, p. 1098, etc.

³ The above statement is ventured, though we are aware that several writers (*e.g.*, Leeds, E. T., *Archæology of Anglo-Saxon Settlements*, p. 25, Oxford, 1913) would claim that the Anglo-Saxons were physically very different from all previous inhabitants of Britain. Neither view has, as yet, sufficient evidence in favour of it.

the onset of the Early-Iron-Age people along the valleys, at some time not very distant from the Roman invasion, were still in a condition to hold out strongly against the Romans. Haverfield,¹ in fact, believes that they never were really Romanized at all. The Romans opened up and guarded lines of communication, built camps, developed exchange with the people and so on, but seem to have remained apart from their life. The local language doubtless borrowed much from Latin, but it did not become effete, a mere patois of kitchen, farm and workshop, as it did, when it did not entirely disappear, on the English plain. It is likely that, towards the end of Roman times, many men followed Maxen Wledig away from Britain, and that wealthy folk left the country as security diminished. The population of the English plain would thus be much weakened intellectually and linguistically: its Latin would be little better than what one might call "pidgin Latin," and so its people would be fairly easily won to a new language; it was otherwise in the west. In picturing the drift away from Britain we may remember that even in the non-Latin regions,² probably owing to raids of Picts and Scots upon the weakened Roman protectorate, the leaders seem to have streamed away to Armorica (A.D. 450–500) with bands of military associates. Budinsky³ makes another point. He does not think it likely that Anglo-Saxon would have ousted Latin effectually, and draws the conclusion that the Anglo-Saxons found a Celtic language in possession.

Haverfield⁴ evidently believes in a Celtic revival in the fifth century, when the Romanized area was cut off from Rome, and its nearest neighbours were the less Romanized British districts of west and north. Leeds⁵ thinks that the Roman towns of Wroxeter and Chester were destroyed by hill men issuing from Wales long before Angles or Saxons reached such distant parts. Haverfield wonders, from analogy with conditions in Bukowina, whether even on the English plain the peasantry may not have remained largely Celtic, borrowing Latin words in their dealings with the Roman authorities for provisioning the army and so on.

Gomme⁶ has stated a case for the survival of Romano-British London until such time as it could enter into the Anglo-Saxon polity by agreement, and he mentions Roman survivals in the customary law of London down to the eighteenth century. Haverfield looks upon this view as a product of generous enthusiasm. Leeds accepts something of Gomme's view in a measure, but claims, on archaeological evidence, that Saxon immigrants must have made full use of the Thames route unhampered by London. They utilized the south side of the river, leaving the extensive forest of the London Clay and the boulder clay on the north, and, he claims, they reached Wessex along this route.

¹ Haverfield, F. J., *Romanization of Roman Britain*, pp. 24, etc., 3rd edition, Oxford, 1915.

² Williams, Hugh, *Christianity in Early Britain*, pp. 283–4.

³ Budinsky, *Die Ausbreitung der lateinischer Sprache*, Berlin, 1881.

⁴ Haverfield, F. J., *The Romanization of Roman Britain*, 3rd edition, 1915, Oxford, *passim*.

⁵ Leeds, E. T., *The Archaeology of the Anglo-Saxon Settlements*, 1913, Oxford, *passim*.

⁶ Gomme, Sir G. Laurence, *London*, 1914.

Without wishing to enter into the controversy, it seems to us that Leeds' position is a reasonable one, and perhaps it does not necessitate a belief in the utter desolation of London, for the Saxon immigrants apparently avoided towns and Roman roads.

In any case it is interesting to notice that in the wild forest country north of the Thames, backing upon the Chilterns, the Neolithic types have survived in characteristic fashion, and this appears to be a region with several peculiarities, as, for example, the lack of any need for Enclosure Acts in the eighteenth century.

Leeds adds archæological evidence for the general belief that the struggle¹ between "Saxon" and "Celt" in Wessex was a long and hard one, marked by many vicissitudes of fortune. It is thus in the highest degree improbable that the Romano-British population here was ever exterminated.

To sum up thus far as regards the population of South Britain:—

In most parts there would be a Neolithic foundation.

In Merionethshire, Cumbria, and perhaps elsewhere, and also among some of the old intellectual families, one would find the Beaker-Maker type.

Along the west one would find the dark broad-heads.

In East England one would find many medium-to-broad-headed fair people of either Brythonic or Anglo-Saxon stock, probably of both. They would also be found in Powys.

In the estuarine lands, using these terms broadly, of both east and west, as we shall next develop, would be Nordic types (2 (a)) now speaking English in most places but Welsh in others, just as some of them speak Breton in Brittany.

The contrast between England and Wales we may put as follows:—Owing to the circumstances of the Roman and post-Roman period, the languages of Anglo-Saxon invaders triumphed over native speech, probably in spite of a very considerable survival of British people, and thus the English plain now represents a later phase of the British (or should we call it the Anglo-Celtic?²) tradition; the Welsh hills represent an earlier one. Doubtless both are really rich in pre-Celtic survivals, could we but separate and identify them.

There seems little doubt that, as the Roman hold weakened, invasions from Ireland, probably in search of metals from mines worked under Roman orders, affected Wales, and especially, perhaps, Gwynedd and Dinefawr. It is quite

¹ Major, A. F., *The Wars of Wessex*, Cambridge, 1913.

² If the expression of a personal opinion may be allowed, it is that the accepted term should be British, as "Anglo-Celtic," though so much more correct than Anglo-Saxon, has neither the comprehensiveness nor the romance of the better known and rightly honoured "British." To use and to take pride in the term British would help us to get back to the broad Elizabethan attitude, so much richer and more artistic than that which was in fashion in the Victorian period.

possible that the "Gwyddel" place-names referred to above (p. 145) are really reminiscences of these invasions, as the Oghams seem also to be. A little later, again, there was much peaceable intercourse between Ireland and Dinefawr, and the promontory of St. David's offered a series of alternative landing-places for small craft. It is probably at a suitable and fairly fertile spot, focal for these landing places, and near a site of prehistoric sanctity and renown, that the Christian centre of St. David's developed. The peaceable intercourse of the Saints led from Ireland past St. David's, along the South Wales coast, to south-west England and Brittany, *i.e.*, more or less, our old western coasting route reappears as an important vital fact once more, and that during a period of disturbance on the east.

One must not forget this Ireland-to-Wales movement, even in connection with the dark broad-heads discussed for both sides of the Irish Sea in an earlier section of this paper. As regards this, however, post-Roman movements can hardly account for the distribution of dolmens, gold lunulæ, dry-walled towns and so on, and the coincidences of distribution of several of these make it more probable that the dark broad-heads belong to the earlier rather than to the later movements.

It is worth noting that in some parts of Dinefawr, notably in Mid-Cardiganshire back from its open and approachable coast, there are numerous fair people with rather broad heads and fairly frequent red tendencies. Whether these are incomers (of some period) from Ireland, as is sometimes imagined locally, is a doubtful point; but of the existence of these people, and of a certain resemblance to Irishmen of fair types, there is little doubt. Our map-register (Fig. 1) and analysis of Mid-Cardiganshire may be consulted (pp. 82-83 and 118).

The occurrence in Wales of Nordic types, like those just mentioned but showing every evidence of kinship with Scandinavia, has already been noted in several places. Pembrokeshire and Gower doubtless received a strong infusion of new blood, and the Celtic languages have had to retreat to the hills; their boundary should be mapped with greater precision. In South Cardiganshire, however, at Newcastle Emlyn (see pp. 77-80) types which are obviously Nordic have become Welsh-speaking.

The estuaries and inlets of East Britain received a strong Nordic infusion between Roman and Norman times, and behind the meagre historical data of those times we see the conflict between the estuarine kingdom of Deira, round about the port of York, soon in the hands of the invaders, and the British kingdom of Elmet in and above the forest of the moorland slopes in the West Riding. We also see westward movements of Celtic-speaking warriors, probably under pressure from the east and the sea, and note especially the legendary conquest of great tracts of Wales by Cunedda and his sons. Some would ascribe the settlement of our Bala-cleft type in its present location to this movement, but we think the matter must remain more indefinite for the present, though we recognize that the type is closely connected with a Cumbrian stock.

In the first stages of Norman interference with Wales, one seems to see an

(See references on pp. 113-118.)



FIG. 1A.



FIG. 1B.



FIG. 2A.



FIG. 2B.

GEOGRAPHICAL DISTRIBUTION OF ANTHROPOLOGICAL TYPES IN WALES.

(See references on pp. 117-118.)



FIG. 1B.

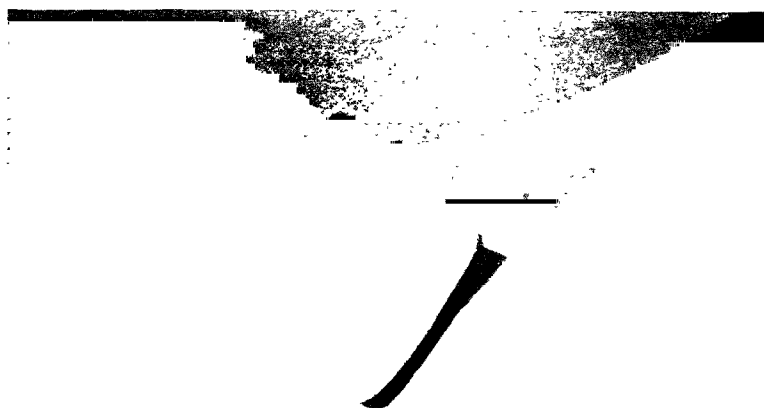


FIG. 1A.

GEOGRAPHICAL DISTRIBUTION OF ANTHROPOLOGICAL TYPES IN WALES.

(See references on pp. 116-118.)



FIG. 1A.



FIG. 1B.



FIG. 2A.

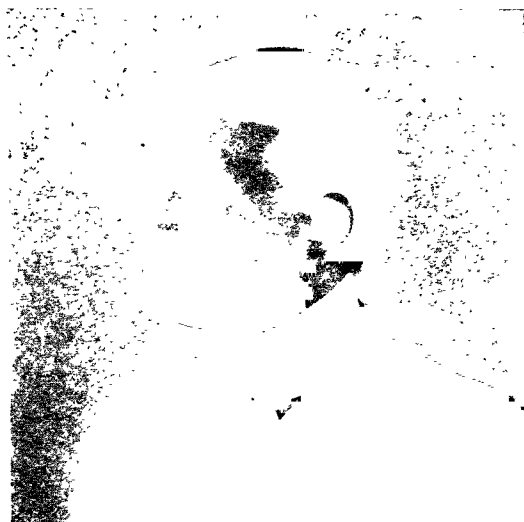


FIG. 2B.

GEOGRAPHICAL DISTRIBUTION OF ANTHROPOLOGICAL TYPES IN WALES.



FIG. 1.—NORDIC TYPE.
COLOURING FAIR, HEAD NOT BROAD.



FIG. 2.—BROAD-HEADED BROWN-
AUBURN HAIRIED TYPE. TOWYN.
(BEAKER-MAKER TYPE.)



FIG. 3.—RATHER BROAD-HEADED FAIR TO
REDDISH TYPE FOUND IN MID-CARDIGANSHIRE,
AND ELSEWHERE IN S.W. WALES.



FIG. 4.
(Reproduced from a photograph by
Dr. J. Beddoe.)



FIG. 5.
(Reproduced from photographs by Dr. John Beddoe.)



FIG. 6.

(See references on pp. 113-118.)



FIG. 1.—BEDDOE'S PURE BASQUE.

(Our type 1 (*a*), p. 115.)



FIG. 2.—BEDDOE'S BASQUE.



FIGS. 3 AND 4.—BEDDOE'S CYMRO-BRONZE.

(Our type 2 (*c*) or perhaps 2 (*b*).)



FIGS. 5 AND 6.—BEDDOE'S BASQUE-IRISH. (Probably our type 1 (*a*) or 1 (*c*).)

Reproductions from a series of illustrations labelled by Dr. J. Beddoe and his friend, Dr. Davies of Bristol and Aberceri, Newcastle Emlyn, Cardiganshire.

The illustrations depict ministers of one of the religious bodies in Wales in the middle of the nineteenth century, and the series is being deposited in the collections at the Royal Anthropological Institute, through the kindness of Mr. and Mrs. R. G. Heaven of Aberceri.

GEOGRAPHICAL DISTRIBUTION OF ANTHROPOLOGICAL TYPES IN WALES.

attempt to control and keep open lines of communication, perhaps much the same kind of effort as the Romans made, but with less regard to mines and mining. The penetration in both cases is largely via Powys and via North and South Wales coasts, and we are probably not far wrong if we transfer the broad scheme of penetration of Roman and Norman and apply it also to the penetration of invaders of the Early Iron Age, allowing that these earlier conquerors soon penetrated more intensely than the later ones. They were working under pressure from the east, the others were conquerors anxious mainly to keep Wales quiet.

With the Normans, we get settlements of Flemings in South Wales, again probably Nordic or Alpine-Nordic types, and the establishment of the lines of castles, some guarding the small havens, others the roads. Their development was doubtless related to the gradual subjugation of the native population which gathered on higher ground in most cases.

Of later settlers, we have mention of Huguenots in weaving districts like Montgomeryshire and Carmarthenshire, and perhaps more than one settlement from Ireland, but it is not possible at present to do much towards the identification of these smaller elements as regards physical type in Wales or England, and this survey of the main constituents of the population of South Britain must be closed. We hope we have shown what interest there would be in a really detailed survey of English types, and we have endeavoured to remember that, till this is achieved, many of our results must remain provisional, even in an unusual degree.

It seems probable that social and economic changes affect the relative proportions of the various types, and thus alter the constitution of the nation. The waxing and waning of various diseases quite probably leads to differential elimination, and thus again affects the constitution of the nation also. Perhaps a wise national policy would be one that sought to maintain in health and opportunity a great variety of human stock, in order to obtain richness of constructive activities, as well as of mutually critical tendencies; questions relating to distribution and changes of distribution of race-types would thus very probably be of great public importance, could they but be examined in sufficient detail.

In agricultural days, the rather broad-headed, somewhat fair type we know as John Bull may have been very characteristic of the yeomanry, just as the Nordic type was prominent among the hunting aristocracy, and the Beaker-Maker type is among the intellectuals. Much land in South Britain has recently gone back from crops to pasture, and in several districts old farmhouses of the wheat-growers are in the hands of rougher stock-rearers, who as yet care little for their amenities, and let them decay. They live more cheaply and roughly, and, taking them all in all, they show a larger proportion of the Neolithic type than was probably living on the land in the corn-growing days.

The growth of the large agglomerations called industrial towns has led to much immigration from the country, and in the second generation of big-town life, under the poor average conditions of the British industrial area, it would seem that the Neolithic or Mediterranean type increases in conspicuous fashion. Nordic

types apparently do not easily withstand pathogenic influences of the big town, and it is said that they form a large proportion of those who emigrate from England to newer lands.

The moorlands and hill country, again, have limited possibilities and tend to export men (again of Neolithic type to a large extent) to the large towns and to the plains below the hills. The west of the English Midlands is full of Welsh family names.

Various causes have thus conspired to bring about, as it were, a resurgence of the fundamental type in our population, with interesting consequences. Beddoe and others have more or less assumed that this resurgence is necessarily bad, and that it is "superior" types that are going. That is probably begging some rather large questions, or, it may be, economizing thought by uncritical acceptance of theories developed abroad in support of what has been inaccurately termed Teutonic race-pride. It would be truer to picture each stock making its own contributions to the commonwealth and to argue for adequate opportunities for each. France is a great example of richness in thought and effort of many kinds, and this is not unconnected with the richness of admixture of types of European stocks in its population, and the variety of environment and opportunity available.

Another point of general interest may be mentioned. It is now customary to examine physically school-children and others, and it would be useful to work towards discrimination of types in connection with such research, as well as to study sequences of the growth-phenomena for the various types. It might, of course, be found that, during phases of growth, the individual works through different phases of its complex racial inheritance. Some types doubtless have small measurements, and it is unwise, in such case, to put down a "bad" set of measurements entirely to unhealthy conditions. Better conditions, none the less, will probably bring increased measurements of most types, but, with town-planning, might also increase the proportion of those non-Neolithic types again, if it be a fact that they have dangerously diminished.

Again, to the making of our present social system in bygone centuries it is probable that, owing to circumstances at the time, the non-Neolithic population contributed a predominant share. It is thus not surprising that maladjustments are but too apparent in districts where a dense modern population is mainly of moorland origin, and has thus come down into a society adapted to other thoughts and other inherent traits.

What the psychical tendencies of the various types may be is not for us to argue; very little is as yet known as to correlation of physical and psychical type. We have, indeed, given hints as to occupations frequently followed by the different types, but we must add that the occupation is often, doubtless, only indirectly correlated with the type and much more directly with the place of upbringing, whether moorland or estuary or valley-cleft.

It is useless at present to attempt to appraise the various constituent stocks of the population, but everything points to the importance of maintaining all at their

best physical and intellectual levels, with all their varied accumulations of tradition for the enrichment of the commonwealth.

We are deeply indebted to the Guild of Graduates of our University of Wales for its assistance in the form of an annual grant and its continual encouragement of the work, and to a host of friends throughout Wales who have helped to make our head-hunts successful. Messrs. J. Thomas and Ll. T. Jones have done a great deal of work for us in Harlech and Tregaron. We owe a special tribute of personal gratitude to our friends, the late Professor Sir Edward Anwyl, the late Professor Herbertson, and the late Sir John Rhys. Dr. Haddon, Professor J. L. Myres, and Mr. H. J. E. Peake have given help and suggestion repeatedly, and to them also do we tender our warmest thanks. The Royal Society very generously gave us an initial grant towards purchase of instruments and a further grant of £50 for 1914 to meet the expenses of secretarial work towards the laborious final analysis of results. Mr. Flattely, Mr. D. R. Jones, and Mr. Whitehouse gave great help in drawing maps and taking photographs for us, and our best thanks are also due to the friends who have allowed us to use their photographs as illustrations of types and to the photographers who took pains to depict them appropriately. Mr. J. H. Shaxby, B.Sc., has helped at many different stages. To Dr. Lynn Thomas and Sir E. Vincent Evans, C.B., also, we wish to express our grateful thanks.

Finally, we wish to offer our thanks to Professor Arthur Keith, the President of the Institute, for his interest in this work, and to Sir Thomas Wrightson, Bart., for most generous help which has very greatly improved the illustration of this paper, and has thus made it far more complete than it could otherwise have been.

UNIVERSITY COLLEGE OF WALES,

ABERYSTWYTH.

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RACIAL ELEMENTS CONCERNED IN THE FIRST SIEGE OF TROY.

By HAROLD PEAKE.

[WITH MAPS.]

RECENT events have drawn our attention vividly to the Dardanelles, and have reminded us of the siege of Troy; but it is not so well remembered that, before the erection of the city of Laomedon, several earlier settlements existed successively on the mound of Hissarlik, one of which was sacked a thousand years before the events related in the *Iliad* took place. It is to the fall of this earlier city that I wish to draw your attention.

The investigations of Schliemann have shown us that many towns—some of them fortified cities, others mere humble villages—have stood consecutively on the mound of Hissarlik, the site of Troy.¹ His work there, as befitted his purpose, was heroic but by no means scientific, and the researches carried on subsequently with more careful methods by his lieutenant, Dörpfeld, have shown that the city, which Schliemann fondly identified with Priam's Troy, was destroyed a thousand years before, while the remains of the Homeric city had escaped the observation of this pioneer of excavators.

It may not be out of place to recapitulate briefly the account of the successive settlements as described by Dörpfeld.² In the beginning there was a humble village, Hissarlik I., inhabited by a population of simple peasants, poor and uncultured and apparently ignorant of metal. This neolithic village resembled in some things the primitive settlement at Cnossos, and was, probably, more or less contemporaneous with it, though possibly rather later in date.

To this succeeded the castellated city, Hissarlik II., with its brick wall and towers at intervals—the Burnt City of Schliemann. That it lasted for some time, probably for many centuries, seems likely, for its walls were twice rebuilt, each time on fresh foundations. The remains found amidst its ruins, which include the so-called "Treasure of Priam," of which more anon, show that the wealth of its inhabitants was considerable, as might be expected in the case of a fortified city, dominating the chief trade-routes of that area, including the water-way of the Hellespont and the land-way which here crossed the straits.

After its destruction the site was for a while deserted, for its destroyers passed on and erected no new fortress on the spot. Ultimately three humble

¹ Schliemann : *Ilion* (1881) ; *Troja* (1884). Schuchhart : *Schliemann's Excavations* (1891).

² Dörpfeld : *Troja und Ilion* ; Leaf W., *Troy*, the best account for English readers.

villages were built in succession, Hissarlik III., IV. and V., and some centuries later arose the City of Laomedon, Hissarlik VI., whose destruction is recorded by Greek tradition.

Our first inquiry must be: Who were the people who built and occupied the "Burnt City," and who were the foes who destroyed it? Very few human remains were found among the ruins, but such as were discovered may perhaps give us the clues we need. By the side of a house in this city were the remains of two warriors with halberds. The skulls of both were long, the indices being respectively 68·6 and 73·8; in one the eyebrow ridges were strongly developed, the chin projecting, broad and angular, and the upper part of the nose narrow; the other skull was narrow and high, the lower jaw strong, the chin broad and projecting. As the only long bones preserved were a broken humerus and a femur, of which parts of the great and small trochanter are missing, it is impossible to calculate their stature with any degree of exactitude. A female skull, found in a jar, was also long but of a different type, while another female skull, dating from a slightly earlier time, was broad, with an index of 82·5.¹

To interpret this evidence we must take a general survey of Europe at this period—about 2000 B.C. or earlier—when the use of stone was giving way slowly to the use of metal. In doing this we must banish from our minds all thoughts of ethnic divisions as they were known in later days—we must not talk of Persians, Hittites, or Greeks, nor even of Lydians, Phrygians, Achæans or Pelasgians, for such ethnic units had not then come into existence. Nor will the terms used by the comparative philologist be less misleading. To talk of Celt, Teuton or Slav is to distinguish between later groups not yet differentiated, and which had no separate existence, so far as our present information extends, until more than 1,500 years later.

But if those names and groups are useless and meaningless, on what can we fall back? As anthropologists we realize that racial distinctions were as true then as to-day, in fact more true, for the admixture of races, which has been proceeding in Europe with ever-increasing rapidity since the Neolithic Age, has made the race problem infinitely more complex to-day than in the time that we are dealing with, when but little admixture seems to have taken place.

There is some difference of opinion among anthropologists as to the value to be set upon skull-form as a criterion of race, but the vast majority are agreed that the shape of the skull is the most permanent factor. This is not the place to argue this controversial topic, and I will content myself with saying that I am in agreement with the majority, and that I accept the statement of the case made by Professor Ripley² as substantially true, even though I may differ from him in some of his minor conclusions. Following Ripley, then, I will take as a postulate that the whole of Europe and the surrounding areas have been peopled by three races,

¹ From a description by Professor Virchow in Schliemann's *Ilios*, pp. 507-12. See also Virchow, "Altrojanische Gräber und Schädel," in *Abhand. der Kön. Pr. Akad. der Wiss. zu Berlin*, 1882.

² Ripley, W. Z., *The Races of Europe* (1900).

and that the present population consists of the descendants of these in a pure or mixed form.

It is true, as Ripley admits, that there are traces of other elements. Mongol or Mongoloid peoples have entered Europe from Asia at various times. We have the Turks, the Bulgars and the Magyars, and perhaps some remnants of the hordes of Attila. Earlier we have the Scythians, and earlier still those Finnic tribes who crossed the Urals and spread up the higher reaches of the Volga till they reached the shores of the Baltic. According to Mr. John Abercromby, the earliest of these did not enter Europe until 1500 B.C.,¹ but there is other evidence that the advance guard arrived very much earlier. Over the greater part of Sweden—all in fact except a strip of coast-line on the western side of Scania—and all along the eastern shore of the Baltic from the Gulf of Bothnia southwards and westwards as far as a point midway between the Vistula and the Oder, there are found abundant remains of a primitive civilization which dates from the Neolithic Age, and indeed from early in that age.² This civilization, known as the East Scandinavian or Arctic culture, extended, perhaps later, over the whole of Norway and seems to be ancestral of that of the Lapps. Professor Montelius states that it was the culture of a broad-headed people, who were the first inhabitants of this area before the arrival of the tall Scandinavians of the Nordic race,³ and a skull found at Möen, in the Danish archipelago, belonging to one of these broad-headed people, is scarcely distinguishable from those of the modern Lapps, who are admittedly Mongol or Mongoloid.

Several skulls found at Furfooz in Belgium, amid surroundings stated by some to be pleistocene, have been claimed as belonging to the same race,⁴ but though the forms of the skulls are similar, the facial portions show marked differences. It may be that this Mongol or Mongoloid people had advanced as far as the Ardennes in late palæolithic or very early neolithic times, but we seem to be on safer ground in suggesting that they had reached the Danish archipelago before the arrival of men of the Nordic race forced most of them northwards and eastwards until they survived only in Lapland and Finland, though, for all we know to the contrary, they may still form the basis of the population of East Pomerania, and West and East Prussia.

There may also be minute traces of negro blood in the south, probably of comparatively recent origin, and other traces, very much diluted, of primitive races surviving from early palæolithic times in the countries of northern Europe. But subject to these exceptions, the last of which is the only one that affects our problem, I start out with the view that the peoples of Europe are derived from one or more of the three races, the Mediterranean, the Alpine, and the Nordic.

¹ Abercromby, The Hon. John, *The Pre- and Proto-Finns*.

² Dr. Knut Sterjna, "Les groupes de civilisation en Scandinavie, à l'époque des sépultures à galerie," in *l'Anthropologie*, xxi, 1.

³ Montelius, O., *Sweden in Heathen Times*, p. 39.

⁴ Pruner-Bey, "Sur les origines hongroises," *Mem. Soc. d'Anth.*, ser. i, vol. ii.

The distinguishing features of these three races are so well known that I need not describe them; especially is this the case with the Mediterranean race, so clearly defined by Professor Sergi.¹ But the details of the Alpine race are not so clearly understood or so thoroughly agreed upon. There are, in fact, several types of broad-headed men in Europe and its neighbourhood, and it is not agreed that they all belong to the same race. Leaving out of consideration for the moment the type known variously as Bronze Age type, Round-barrow men, or, as I should prefer to call them, Beaker-folk, of whom I will speak later on, there are two distinct types of broad-headed men to be found in Europe, as well as remains of one or more less well-known varieties. The true Alpine is usually considered to be the short broad-headed, broad-shouldered Auvergnat type, which is found in Central France, South Germany and Austria, and he differs in many points from the tall hypsi-brachycephalic type of the Balkan Peninsula, which is called the Dinaric type by Dr. Deniker.² The latter type bears a close resemblance to the Armenoid or Anatolian type prevalent in Asia Minor. There are also the broad skulls found at Grenelle, near Paris, which are said by some to be of Pleistocene Age.

I would, therefore, suggest that the Alpine race reached Europe, probably from Asia Minor, in three successive waves. The first of these arrived in late palæolithic times, and reached the valley of the Seine. The second occupied the highlands of central and western Europe, while the third eventually occupied the Balkan Peninsula south of the Danube. Doubtless each wave pressed its predecessor forward, and it would appear not unlikely that "nests" of the earlier waves might be found in areas of isolation in the regions occupied by later waves.

The Nordic race has been less carefully studied than the others, and though it is readily recognized in the flesh by its fair colouring and complexion, it is not so easy to distinguish it in skeletal form. Where a number of graves are found together, with like furniture, the average stature of the individuals, as calculated from their long bones, will usually be sufficient to enable a distinction to be drawn between this race and the Mediterranean, for the men of the Nordic race are generally much taller than the others. Whether individual skulls can be distinguished is more doubtful. Many anthropologists deny the possibility of recognizing this distinction from the skull alone, but Professor Rolleston has firmly asserted the contrary point of view, and declared that his assistant at Oxford could unfaillingly distinguish between British neolithic and Scandinavian skulls.³

But Professor Rolleston found it difficult to define this difference, except that the Nordic jaw is invariably more powerful than the Mediterranean. No good definition of the distinctions believed to exist between these two types has, so far as I know, been drawn up, but some will perhaps agree with me when I say that the

¹ Sergi, G., *The Mediterranean Race* (1901).

² Deniker, J., *The Races of Man* (1900).

³ Rolleston, G., in Greenwell, W., *British Barrows*, p. 646.

Nordic skull, besides being more massive, is usually higher and more arched in profile, that it is broader in the occipital region, having often an index as high as seventy-nine, while the supra-orbital ridges are far more prominently marked than is the case among pure Mediterranean types.

The Mediterranean race seems to have arisen somewhere in the northern half of Africa, and to have reached there from elsewhere at a very early epoch. Before the close of the Pleistocene Period the advance guard of this race had reached the southern shores of France, and long before the close of the Neolithic Age they had become well established not only over the whole of North Africa, but throughout much of the south and west of Europe. They occupied the whole of the Spanish and Italian peninsulas, except perhaps the more mountainous parts. They over-ran nearly all France, except perhaps the Cevennes region, but stopped short at the Alps, the Vosges and the Ardennes; it seems uncertain whether they occupied the chalk heights of Artois, then thickly forested, and they certainly did not penetrate Flanders. At an early date they crossed over to the British Isles, and occupied the whole land to the extremest north.

In the east a specialized variety, speaking a uniform language, the ancestor of the Semitic tongues, occupied the Arabian Peninsula. Others inhabited the coast region of Palestine and Syria, but they do not appear to have penetrated the mountain region beyond. Sergi says that they settled early on the coasts of Asia Minor and Greece, but for this I can find no sufficient evidence, though they formed the earliest population of Cyprus, Crete, and most, if not all, of the Ægean Islands.

Sergi cites no evidence in support of his contention that the Mediterraneans formed early settlements in Asia Minor, and the account of the present population of the Anatolian Peninsula, as given by von Luschan,¹ certainly seems to contradict it; moreover, all immigrants from this quarter into Crete, even early in the Bronze Age, seem to have been of the Alpine type.

The Greek problem is similar, and as Sergi's views on this point have often been repeated, the question merits closer inquiry. Until the latter part of the Bronze Age the culture of the Ægean is markedly different from that of the Greek mainland, and while the inhabitants of the former region were advancing rapidly in civilization, those of the latter were rude neolithic savages. This difference in culture, and the lack of communication between peoples who were near neighbours, seems to argue a difference of race. Besides this we have a little skeletal evidence, though it is not as conclusive as one could wish. At the Academia at Athens Dr. Coln Stephanos has a considerable collection of skulls, which he kindly showed to me a few years ago. As he was proposing shortly to issue a catalogue of them, I was precluded from making any notes, but I nevertheless made some observations which have a bearing on this problem. The majority of the skulls are Alpine in

¹ Luschan, Felix von, "The Early Inhabitants of Western Asia," in *Journ. Roy. Anthropol. Inst.* (1911), xli, 221 *et seq.*

type, and a careful examination of the *provenance* of the remainder satisfied me that all had been found either in the islands, or when found on the mainland that they dated from the latter part of the Bronze Age or later. In spite of this, Dr. Stephanos assured me that many of the specimens in his collection dated from early prehistoric times; those, therefore, which did so and hailed from the mainland must have been of the Alpine type.

From these arguments, inconclusive as I admit them to be, I am inclined to believe that until certain Cretan settlements were made in the Middle Minoan Period, the only inhabitants of the Balkan Peninsula were of the Alpine race. This is not strictly true of Thessaly and some parts of the north, but the exceptions I propose to deal with later.

It has been asserted by more than one writer that there was also a settlement of Mediterraneans in the Danube basin. This again I believe to be untrue. The theory rests on two points. In the first place, there have been found in the Danube basin, amid neolithic surroundings, fragments of black burnished pottery, ornamented with incised geometric designs, sometimes filled in with white chalk.¹ Pottery of a like nature has been found in predynastic cemeteries in Egypt and in the neolithic layer at Cnossos. A conclusion was therefore arrived at that such pottery was the common inheritance of the Mediterranean race. Pottery answering to this general description has been found also in Sicily,—at Matrenza and Stentinello, near Syracuse,²—and of a slightly different type near Palermo.³ Other types of somewhat similar wares have been found at various sites in Malta.⁴ Now a careful examination of all these wares has convinced archaeologists that they have not had a common origin, so this class of pottery ceases to be evidence of the presence of the Mediterranean race.⁵ Further, pottery ornamented with incised geometric designs is common throughout Central Europe, the home, as we shall see, of the Alpine race, where it persisted in some areas until the beginning of the Iron Age. It cannot, therefore, be cited as evidence of race.

The other point is a recent statement by Dr. Keith that "Professor Toldt, of Vienna, did not find a single round-head in a collection of skulls gathered from ancient graves in Upper Austria" and that "so far as we can judge, the Danube Valley, in its width and length, was inhabited by a long-headed population in the Neolithic Period."⁶ Dr. Keith has kindly referred me to the article in question, and I must admit that I do not draw the same inference. Professor Toldt is dealing with ancient Slav skulls, which he attributes to the sixth century B.C.

¹ Wosinsky, *Die inkrustierte Keramik der Stein und Bronzezeit* (1904). See also Hogarth, D. G., *Ionia and the East*, p. 116.

² Peet, T. E., *Stone and Bronze Ages in Italy and Sicily* (1909), pp. 129-37.

³ *Ibid.*, pp. 125-9.

⁴ Ashby, Bradley, Peet and Tagliaferro, *Excavations in 1908-11 in various Megalithic Buildings in Malta and Gozo*.

⁵ Dussaud, R., *Les Civilisations préhelléniques* (2nd ed. 1914), pp. 39, 40.

⁶ Keith, A., "The Bronze Age Invasion of Britain," *Journ. Roy. Anthropol. Inst.*, xlv, 9, 18.

though he admits that others would relegate them to the eleventh or twelfth.¹ In either case, however, the date is considerably later than the time I am speaking of, and the long skulls in question resemble those of the *Reihengräber*, which are admittedly Nordic.

The presence of a Mediterranean people, far from the sea, and surrounded by Alpines, is *a priori* unlikely, while the appearance of Nordic men in this area towards the close of the Neolithic Age, or the beginning of the Bronze Age, is exactly what we should expect, as will be seen later.

The Mediterranean race, who came from Africa, were in the habit of burying their dead, and this apparently for two reasons, one theological, the other practical. From early days they appear to have believed in a life after death associated with the body, the germ of the doctrine of the "Resurrection of the Body," while their original home was in arid regions or alluvial valleys, where burial was easy and fuel for cremation expensive. The Alpine race, on the other hand, who seem to have hailed from the high table-lands of Western Asia, and to have dispersed southwards and westwards from the Armenian highlands, have usually dwelt in thickly forested mountain regions, where the soil is rocky and fuel abundant. It is not surprising, therefore, that they have more often than not burnt their dead, though this practice has been by no means universal among them.

The origin and distribution of the Alpine race has not been studied so carefully, nor on these points is there such a general consensus of opinion as exists in the case of the Mediterranean race. It has usually been assumed that this race arrived in Europe from Asia, but even this conclusion has recently been questioned by Dr. Keith, who hints that it may have developed in Central Europe. He regards the reference to an Asiatic origin as a postponement of the difficulty, and points to the fact that Alpine types were present in Europe in pleistocene times.²

With the evidence at present at our disposal, the matter must necessarily remain one of opinion. It is, I think, generally admitted that the inhabitants of Africa, with certain negligible exceptions, are long-headed, while the people of Asia, north of and including the central mountain range, are for the most part broad-headed. Such long-headed exceptions as may be found in Northern Asia lie as islands amid their broad-headed neighbours, and since they seem to resemble the long-headed people of Northern Europe, it seems likely that they are outliers of that race. In Europe, on the other hand, we find people of both types, the broad-headed race occupying a wedge-shaped area with its base resting on the frontier of Asia.³ So that, until strong evidence can be adduced to the contrary, I prefer to believe that all the broad-headed types found in Europe have come originally from Asia rather than that they have developed in Central Europe from a pre-existing long-headed type.

Starting then on this assumption, we find that, perhaps as early as late

¹ *Archiv für Anthropologie*, Neue Folge, Band xi (1912) (*Korrespondenz-Blatt*), p. 72.

² Keith, A., *op. cit.*, p. 21.

³ Cf. Ripley, *op. cit.*, map on p. 42.

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MAP 1.—DISTRIBUTION OF RACES BEFORE THE RAIDS.
RACIAL ELEMENTS CONCERNED IN THE FIRST SIEGE OF TROY.

pleistocene times,¹ a broad-headed type had reached the neighbourhood of Paris.² Early in neolithic times men of the true Alpine type entered Central France, apparently from the east. Thus everything points to the fact that the central highlands of Europe had a broad-headed population at this time.

Now the present population of South Germany and Austria is eminently broad-headed, though a certain proportion of long-headed individuals may be found, but from my own observations these appear to be invariably tall and fair. We know that during the time of the Roman Empire, Germanic tribes invaded this region, and what happened then may have occurred before. That it did so is clear from the existence of the early so-called Old Slav cemeteries, referred to by Professor Toldt, where the types resembled those from the *Reihengräber*; a certain proportion of tall long-headed skeletons have also been found in the Hallstadt graveyard. In spite of these successive infusions of long-headed stocks, the prevailing type is now broad-headed, which seems to indicate that the autochthones have, as usual, absorbed the intruders, and that the autochthones were broad-headed seems established by the discovery of a broad skull at Nagy-sáp, in Hungary, which is said to date from pre-neolithic times.³

It is true that long skulls have been found in this region amid neolithic surroundings, but the evidence adduced by Dr. O. Reche from collections of skulls made in Silesia and Bohemia tends to show that these date from the close of the Neolithic Age.⁴ His statements are very clear and precise, and show that during the period of the *Bandkeramik*, Bohemia and Silesia were inhabited by a people who bear a close resemblance to the Beaker-folk of Denmark and the British Isles, and, in fact, the beakers of the latter countries may be considered as a species of *Bandkeramik*. Dr. Reche considers the culture as contemporary with the galleried tombs of the Baltic region, that is to say, co-eval with the long barrows of this country, which belong to the very close of the Neolithic Age in North Europe. Into this population of Beaker-folk there intruded invaders of the Nordic type, exterminating the men, but marrying the women of the Beaker-folk, and adopting their culture. These invaders are found in some numbers in Silesia, but only penetrated over the mountains into Bohemia in insignificant numbers. They were followed, however, by others of the same race, who brought women with them, and the type of pottery known as *Schnurkeramik*, which had hitherto been confined to the regions farther north.

It is true that few broad skulls of this period have been found in the Danube basin, but as the Alpine race very probably practised cremation in early days, too

¹ Déchelette considers that the remains in question date from neolithic times, v. *Manuel d'archéologie*, i, 286, fn. 2.

² Keith, A., *op. cit.*, 17: *Ancient Types of Man*, 75; Quatrefages and Hamy, *Crania ethnica*.

³ Keith, A., "Bronze Age Invaders of Britain," *Journ. Roy. Anthropol. Inst.*, xlv, 18; Quatrefages and Hamy, *Crania ethnica*.

⁴ Reche, O., "Zur Anthropologie der jüngeren Steinzeit in Schlesien und Böhmen," *Archiv. für Anthropologie*, Neue Folge, Band vii (1908), p. 220.

much importance need not be set on their absence, while the other long skulls found at Lengyel and elsewhere are admittedly Nordic, and probably belong, like those of Silesia and Bohemia, to invaders who arrived at the close of the Neolithic Age.

The conclusion, then, appears to be that starting from the highlands of Asia Minor, the Alpine race invaded Europe across the Hellespont or the Bosphorus in three waves. The first seems to have started in pre-neolithic times, and to have reached the Seine and the Ardennes. The second followed on its heels, but appears to have failed to cross the plain of North Germany, while the third turned southwards and occupied the Balkan Peninsula, though to the north-west it may have penetrated beyond and somewhat affected the stature of the Tyrolese.

Another branch seems to have gone southwards through the Lebanon to the Judæan plateau, and perhaps invaded Egypt in pre- or proto-dynastic times.¹

From Central Europe the Alpine type had already extended some way before the close of the Neolithic Age. In Italy they had occupied the southern slopes of the Alps, and early in the Metal Age some few, at least, had passed down the Apennines as far south as the Alban Hills.² In France they had occupied the eastern mountains and central plateau, mixing freely with the Mediterranean people who surrounded them, and adopting the latter's customs.³ It seems unlikely that they spread over the North German plain, but they appear to have advanced down both sides of the Rhine, leaving remnants in the Ardennes and Thuringia.

The Nordic race presents more difficulties and has been less accurately studied than either of the preceding; it has also been the subject of polemical articles, which seem to have been written to bolster up a false view of pre-history, with the object of proving the incontestable superiority of the Teutonic "Race."

As we have seen, the Nordic race differs mainly from the Mediterranean in its blondness, increased stature and the prominence of its supra-orbital ridges. If, as Keane, Ripley and others suggest, it was originally a branch of the Mediterranean race, it must have started its differentiation at a very early date, for the difference in complexion and stature could not have been achieved in anything less than a very long period of time. It seems likely that it is to be identified with the people, with Aurignacian culture, who occupied the plain of North Germany in late pleistocene times, and who are known to some writers as the Loess-hunters.

The problem is obscure and cannot fully be examined here, but I will suggest that a sturdy variety of the Mediterranean race entered Europe during the Reindeer Period, when *tundra* conditions prevailed. Exposure to a rigorous climate, hard exercise and an almost exclusive meat diet, with ample milk for their young, improved their physique. A slight admixture with what remained of the Neanderthal race developed their supra-orbital ridges, while, after a long period of nomad

¹ Elliot Smith, G., *The Ancient Egyptians*, p. 122.

² A skeleton of Alpine type, found with a copper dagger at Scurgola, is exhibited in the Museo Etnografico at Rome.

³ Taylor, I., *The Origin of the Aryans* (1890), p. 119.

life on the dusty steppes, pasturing cattle, taming horses, and leading a cow-boy existence, their hair and complexions gradually acquired by selection the khaki shades which would be most protective in the environment that they had chosen.¹

At the time we are treating of, the close of the Neolithic Age, they were occupying the Russian steppes east of the Dnieper, where they roamed on horse-back after their herds of cattle. They buried their dead in a contracted position, like their Mediterranean ancestors, but covered the bones in some way with powdered red ochre. Being nomads their *impedimenta* were few, and these probably made of leather, but they had one class of pottery in the form of rude hemispherical bowls.²

There is reason to believe that before the time we are dealing with some had departed to the north-west, for a line of settlements across Poland seems to indicate a somewhat similar culture.³ These northward migrants seem to be the tall men who invaded Scania during the Neolithic Age,⁴ and gradually drove the primitive round-headed folk to the north-west, where they have influenced the present population of Norway, and, I believe, remained in a more or less pure form as Lapps.⁵ The Nordic invaders of Scania gradually became dominant in the Baltic region, and long afterwards spread from this second cradle to destroy the Roman Empire.

Before the close of the Neolithic Age, this race seems to have spread also westward along the southern shore of the North Sea, for a race, corresponding to their description, at that time occupied the lowlands of Belgium west of the Meuse.⁶ It may be that they crossed thence to our island, for there are resemblances between our long barrows and those of Scandinavia, while the hemispherical pots recently found in England amid neolithic surroundings have a distribution across Scandinavia to Finland,⁷ and seem akin to those found with the red-ochred skeletons on the Russian steppes. But until all the skeletons found in the long barrows have been carefully examined by some competent anthropologist, to ascertain whether they are Nordic or Mediterranean, as at present generally believed, we cannot decide this question.

Whether these Nordic people occupied all or any of North-Eastern Germany, and whether Alpine folk were there before them, is by no means certain, though some evidence has been given to show that East Prussia was occupied by people in all probability akin to the Lapp inhabitants of Scandinavia, while the region to

¹ Cf. Myres, J. L., *The Dawn of History*, p. 15.

² Minns, E. H., *Scythians and Greeks*, p. 142-5, where all the literature on the subject is summarized. Mr. Minns rightly objects to the term "Kurgan-people" used of them by Professor Myres, and suggests "red-skeleton people" as a substitute. This is a cumbrous name, and I would suggest in its place the term "steppe-folk."

³ *Ibid.*, p. 132.

⁴ Montelius, O., *op. cit.*

⁵ This has been denied by Ripley, *op. cit.*, p. 210, but *vide supra*, p. 36.

⁶ Taylor, I., *op. cit.*, pp. 118-19.

⁷ Smith, R., "Development of Neolithic Pottery," in *Archæologia*, lxii, pp. 340 and 346.

the west was inhabited towards the close of the Neolithic Age by Nordic people.¹ Though very energetic in these fields of research, the Germans have failed hitherto to gather together into a concise work all the scattered evidence of their early pre-history, which appears in a multitude of different journals, so that the outside world is at a loss to understand the succession of peoples which have occupied Prussia, Silesia and North Poland in remote times.

But enough of the Nordic problem for the moment; we must turn to another people who present greater difficulties. On the western steppes of Russia, west of the Dnieper, and stretching thence through Galicia as far west as Breslau, there lived at the time we are dealing with a people with a homogeneous civilization, known from the site first excavated as the Tripolji culture. These people lived at first in a neolithic state, but some had learned the use of copper before their culture suddenly disappeared. They fabricated quantities of pottery of very distinctive shape and design, sometimes painted with elaborate ornament, sometimes, though more rarely, with incised designs; they made also many figurines, both human and animal.² When this pottery was first discovered, von Stern believed that it was the precursor of the Mycenæan culture of ancient Greece,³ and some sherds, it is true, bear a close resemblance to some from the Ægean area. But when the excavations of Sir Arthur Evans at Cnossos showed that Mycenæan pottery could be traced without a break to neolithic times in Crete, von Stern's views were questioned, and subsequent investigation by experts has shown that the resemblance of the two wares is more apparent than real, that the shapes and design are quite different, and that there is nothing in common but the use of paint and coloured slip. All idea, therefore, of a connection between these cultures had been abandoned, until quite recently it has been revived by a German writer,⁴ who wishes, I suppose, to prove that Minoan as well as Homeric culture is derived from Germany.

We have no direct evidence as to the race that was responsible for the Tripolji culture, for they seem invariably to have cremated their dead. Some skeletons, it is true, are said to have been found, but no description of these has appeared, and it is, to say the least, uncertain whether they belong to this people.⁵ Nevertheless a study of their pottery seems to show that their culture has a double ancestry, and a natural inference is that they were a mixed people. Of the different racial elements that went to make up this mixture we have no direct evidence, it is true, but lying as they did between the Nordic steppe-folk of the east and the Alpine highlanders of Central Europe, we may conjecture that both these racial elements were represented among them.

¹ Dr. Knut Sterjna, "Les Groupes de Civilisation en Scandinavie, à l'époque des sépultures à galerie," in *l'Anthropologie*, xxi, 1.

² Minns, *op. cit.*, pp. 132-40, where all the evidence on the question is admirably summarized.

³ Von Stern, E., *Die "Prämykenische" Kultur in Süd-Russland* (1905).

⁴ Schmidt, *Zeit. Ethnol.* (1911), p. 582.

⁵ Minns, *op. cit.*, p. 140.

This conjecture has recently received support from another source. In his presidential address to this Institute in January, 1915, Dr. Keith discussed the origin of the Bronze Age invaders of Britain, by which he meant the round-barrow folk who arrived in our land either shortly before or shortly after the first introduction of metal. As the result of much acute reasoning, he came to the conclusion that this Round-barrow race had come from the region north of the Carpathians, that is to say from Galicia, the western half of the area occupied by the Tripolji-folk, and his arguments would equally apply to the remainder of the area.¹ Now, as Dr. Keith pointed out, the Round-barrow men were Alpines, but not typical Alpines. They differ from true Alpines by possessing a greatly increased stature, slightly narrower and longer heads, and by a considerable development of the supra-orbital ridges—points which, as we have seen, are marks of Nordic men.

I am inclined to believe, therefore, until a better hypothesis has been advanced, that the Tripolji-folk were a people of mixed Nordic and Alpine ancestry, probably largely Alpine with a Nordic aristocracy.

We have now made a general survey of the racial conditions of Europe and its neighbourhood at the time when the second or burnt city of Hissarlik was destroyed, and we are in a position to determine the racial affinities both of its inhabitants and of its destroyers. Professor Felix von Luschan, in his Huxley Memorial Lecture, states that the original inhabitants of Asia Minor were of the broad-headed Alpine or Armenoid type; but that about 4000 B.C. some Semitic invaders from Arabia arrived in the south-east. "Two thousand years later," he writes, "commenced a second invasion, this time from the north-west, by xanthochrous and long-headed tribes like the modern Kurds,"² that is to say by men of the Nordic race.

If we may accept the Professor's views as correct, and the whole of his reasoning seems sound, we should assume that the people of the burnt city were of Alpine stock, and that the broad-female skull belongs to one of these inhabitants. It is also clear that he considers the warriors' skulls to belong to the invaders, and there seems nothing improbable in this. The long female skull found in a jar presents greater difficulties, unless the owner was some slave taken from the Mediterranean population of the neighbouring islands. If, then, the invading tribes, who were responsible for the destruction of the city, were of the Nordic race,³ whence did they come? Professor von Luschan says from the north-west, but the only Nordic people living anywhere near occupied the eastern steppes of South Russia. Can they have come from thence?

Now it has already been mentioned that the Tripolji culture came suddenly to an end about this time, and all the evidence goes to show that it perished by some catastrophe such as an invasion. About the same time the nomad cattle-men

¹ Keith A., *op. cit.*, p. 21.

² Von Luschan, Felix, "The Early Inhabitants of Western Asia," in *Journ. Roy. Anthropol. Inst.*, xli, p. 243.

³ Cf. Myres, J. L., *Geographical Journal*, xxviii, p. 552.

of the Nordic type disappear from the eastern steppes. The natural inference is that the steppe-folk invaded the Tripolji area and brought its culture to a close, and the evidence at Khalepji seems to show that this was the case.¹ It seems probable that, though some of these invaders overran Galicia and Silesia, driving thence its tall round-headed inhabitants—some of whom went to Denmark, while others eventually reached our shores—other steppe-folk would have passed southwards over the Roumanian plain till brought to an abrupt halt by the Balkan range. Skirting the shores of the Euxine, they would have passed south-west to Adrianople, and thence easily to the shores of the Hellespont, across which was a city famous for its wealth of bronze and gold, a natural temptation to marauding hordes.

But our evidence does not stop here, for far to the south, in Thessaly, whose grassy plains would offer great attractions to wandering horsemen, Mr. Wace found that invaders arrived in the plain of Larissa from the north about this time, bringing with them a type of pottery, Dhimini ware,² which bears a close resemblance to a variety of Tripolji ware found recently at Cucuteni in Roumania.³ Mr. Wace found a few graves belonging to this period, but unfortunately took no notes as to the measurements of the skeletons. One skull, however, he did bring home from Tsangli, and it has been described by Dr. Duckworth, who says that it is mesati-cephalic, having a breadth index of 76.9; that the brow ridges are distinct, the nasal skeleton prominent, and the lower margin of the nasal aperture distinct; the chin is prominent.⁴

Judged by the illustration that he gives, this skull might well be that of a Nordic man. It is rather broader than is usual among men of this race, but scarcely more so than some Sergi figures as coming from the Russian steppes.⁵ The forehead and the root of the nose have certainly a Nordic appearance. With no measurements of the long bones nothing can be said of the stature of the individual, which, as we have seen, is the best way of distinguishing this race; but there is nothing impossible in the view that some of the steppe-folk invaded Thessaly from the north and occupied the Plain of Larissa as far south as Tsangli and Dhimini, bringing with them women (and perhaps slaves) of the Tripolji people, who carried on their former style of pot-making with such difference as fresh materials and the tastes of their masters might impose.

But pottery resembling Tripolji ware has also been found in the highlands of Central Europe, apparently amid neolithic surroundings. Thus ware of this type is reported from Upper Austria, near Trieste, from Bosnia and from Jablaniza in Serbia; it has also been found at Lengyel south of Buda-Pesth,⁶ but apparently

¹ Minns, *op. cit.*, p. 142.

² Wace, A. J. B., and Thompson, M. S., *Prehistoric Thessaly*.

³ Schmidt, *Zeit. f. Ethnol.* (1911), p. 582; Dascalu, *Buletinul Comisiunii Monumentelor Istorice*, iii, p. 195.

⁴ *Man*, xi, 35.

⁵ Sergi, G., *Mediterranean Race*, pp. 226-31.

⁶ Burrows, R., *Discoveries in Crete*, p. 185; Hoernes, *Die Neolithisch Keramik in Osterreich* (1905), *passim*.

with early Bronze Age surroundings.¹ This, however, is a region first of all inhabited, as we believe, by men of the Alpine race. Is it not possible that what has happened apparently in Thessaly has occurred here too? The Nordic steppe-folk, though driven by drought from the grassy steppes of South Russia, would seek for fresh pastures for their horses and cattle. The mountainous regions of the Carpathians and Balkans would scarcely attract them, but the great plains of Anatolia and Hungary, as well as the lesser plains of Thessaly and Upper Austria, would provide exactly what was needed. Moreover, as we have already seen, long-headed people of the *Reihengräber* type have been found here with Bronze Age, and perhaps neolithic, surroundings.

I would suggest, therefore, that once the steppe-folk had crossed the Dnieper and destroyed the Tripolji culture, one branch advanced across Galicia into Silesia, driving thence its primitive inhabitants, some of whom, after many wanderings, reached the shores of England, while other steppe-folk crossed the Carpathians, occupied the plains of Hungary, Lower and Upper Austria, and penetrated even to Bosnia and Serbia. Another branch went through Roumania, and, crossing the Danube, passed along the south-west shore of the Euxine. Some of these crossed the Hellespont, sacked Hissarlik II., and proceeded to the grassy plains of Central Anatolia, while the remainder, skirting the coast of the Ægean, found their way to Thessaly, and settled in the Plain of Larissa. On their way they took wives or slaves, or both, from the Tripolji people, whom they had displaced, and these continued to make pottery in their new homes, with shapes and ornament similar to the ware they had made in South-west Russia.

Such an hypothesis cannot, I must admit, be susceptible of absolute proof with the evidence at our disposal, yet many of the facts cited seem to indicate some such explanation, while the hypothesis as a whole seems to account for all the phenomena noted.

Hitherto I have been content to refer to the times with which I have been dealing, as being about 2000 B.C., but it is clear that I must attempt a closer and more accurate dating if the hypothesis is to be tested by ascertaining how it fits with events known or believed to have occurred elsewhere about this time. Dörpfeld provisionally dated the fall of Hissarlik II. at 2000 B.C., but his calculations were made mainly from the depths of the deposits without any attempt at synchronisms with outside data, and his suggestion seems to have been intended only as a provisional date.

All chronology in the eastern Mediterranean, and for that matter throughout the whole area that we have been considering, is ultimately based on that of Egypt. It is not my object to discuss the respective merits of the various schemes adopted by different schools of Egyptologists²; I will only say that the European facts seem to be reasonably explained if we use the shortest chronology put forward for

¹ Dussaud, R., *Les Civilisations Préhelléniques* (2nd ed., 1914), p. 205.

² The conflicting views are fairly stated by Hall, H. R., *Ancient History of the Near East*, pp. 15-30.

Egypt, while if we employ the longest our early metal periods will be stretched to an apparently impossible extent. As the short chronology has the support of many Egyptologists in this country, of all those in Germany, of M. Dussaud in France, and Professor Breasted in America, I need make no further apology for using it as a basis for further argument.

If, then, we start from this basis, we shall find that all Ægean archæologists¹ are agreed that the dates for the early Cretan periods are—

- Early Minoan I 3000 to 2600 B.C.
- Early Minoan II 2600 to 2400 B.C.
- Early Minoan III 2400 to 2200 B.C.
- Middle Minoan I 2200 to 2000 B.C.
- Middle Minoan II 2000 to 1850 B.C.
- Middle Minoan III 1850 to 1600 B.C.

M. Dussaud, working on this basis, has recently suggested that the date of the destruction of Hissarlik II. must be brought down as late as 1900 B.C.,² and as this view is not generally accepted, it may be well to examine his reasons. Basing his arguments on certain analyses of metal implements made by the late Professor Mosso, M. Dussaud argues that during the Early Minoan Period the people of Crete, while using copper freely, were ignorant of the use of bronze, and that this ignorance was common to all the populations of the Eastern Mediterranean, who were living in a pure Copper Age until 2200 B.C.³ As the implements found in the "Treasure of Priam" show a fairly advanced knowledge of the use of bronze, the fall of Hissarlik II. must therefore be placed some centuries later.⁴

This statement regarding the Copper Age, however, is in direct contradiction to the views expressed by Sir Arthur Evans, Mrs. Boyd Hawes,⁵ and other Cretan explorers, and most archæologists do not care to place too much reliance on the analyses of Professor Mosso. Even were this statement true for Crete, it does not follow that it was equally true for other districts in this area, and Hissarlik, trading, as we know it did, with the Danube basin, may have obtained some of its supplies of copper from Bohemia, where tin is also found. In any case, if M. Dussaud's arguments are sound, the universal Copper Age should include Egypt, yet Professor Mosso tells us that the statue of Pepi I. of the sixth dynasty contains 6.557 per cent. of tin,⁶ though Pepi was living during the second Early Minoan Period.

There is some conflict of evidence here, and, on the whole, I prefer to believe that during the second and third Early Minoan Periods the knowledge of bronze existed, perhaps as a jealously guarded secret, among some people or peoples in the

¹ Except that Dussaud, *op. cit.*, brings Middle Minoan II to a close in 1800, and extends Middle Minoan III to 1550.

² Dussaud, R., *op. cit.*, p. 120.

³ *Ibid.*, pp. 42, 43.

⁴ *Ibid.*, p. 123.

⁵ Hawes, C. H. and H., *Crete the Forerunner of Greece*, p. 17.

⁶ Mosso, A., *The Dawn of Mediterranean Civilization*, p. 56.

Eastern Mediterranean area, and that though copper was in general use throughout this region, implements and other objects of bronze were not unknown, even if metallurgical knowledge of the alloy were restricted to a limited area. There is nothing, therefore, in the presence of well-developed bronze objects in Hissarlik II. to compel us to believe that its destruction took place as late as 1900 B.C.

It seems to me that we have a better synchronism in that suggested by Mr. Hall, who states that "there is no doubt that 'Early Minoan III' is roughly contemporary with the Second 'City' of Troy; they mark the same stage of culture."¹ He bases his view on the general resemblance between the gold ornaments in the "Treasure of Priam" and those found by Mr. Seager in a tomb in the island of Mochlos.² It is true that the gold ornaments in question do not bear a very close resemblance to one another, but Mr. Hall is probably right in attributing them to the same period of culture.

Mr. Hall considers that the Mochlos treasure belongs to the third Early Minoan Period, but M. Dussaud points out that much of the pottery found in the tomb is more characteristic of the previous period, though, as he admits, to the close of it.³ We may, therefore, give as the date of the Mochlos treasure 2400 B.C. or a few years later. Comparing the two sets of gold ornaments, one cannot help feeling that those from Hissarlik are the more developed of the two, and may date, perhaps, a century later. Also they had been concealed, perhaps for some time, before the city was sacked, and so escaped the notice of the invaders. Any attempt to give dates with precision is, of course, hopeless, but I will suggest provisionally that the evidence points to 2300 B.C. as the date of the "Treasure of Priam," and that the sack of the city occurred some time during the following century.

The Middle Minoan Period, which is believed to have begun about 2200 B.C., witnessed the sudden rise of a new development in culture in Crete, accompanied by some movement of peoples and the arrival of broad-headed people in the east of the island, apparently from Asia Minor; a similar sudden development is also witnessed in the Cyclades. This seems to point to the fresh start in arts and manufactures that is frequently observed a few years after the cessation of a war or a period of unrest. I cannot help thinking that this development in the islands was the sequel to the disturbances on the mainland that I have outlined, and I am therefore inclined to place the destruction of Hissarlik II. during the latter half of the twenty-third century—that is to say, about 2225 B.C.

Let us now follow another line of inquiry, which, though at first sight not very promising, will, I think, give us valuable aid. Some few years ago Mr. Ellsworth Huntington, after spending some time in Central Asia with the Pumpelly expedition, wrote a most valuable work, "The Pulse of Asia," in which he brought forward conclusive evidence that the whole of that continent had been affected by intermittent periods of drought and moisture, as shown by the rise and fall of the

¹ Hall, H. R., *Ancient History of the Near East*, p. 39.

² Seager, *Explorations in the Island of Mochlos*.

³ Dussaud, R., *op. cit.*, p. 87.

inland seas.¹ This view he has since tested in Palestine, especially with reference to the Dead Sea, and his conclusions are that these recurring periods were felt over the whole of the northern hemisphere, if not throughout the whole world.²

He has pointed out, moreover, that during the periods of drought the pasturage for cattle would be diminished, sometimes to starvation level, and that in consequence the nomad cattle-men would be forced to seek new pastures in the moister climates, where agricultural operations had long been in progress. He reminds us that such raids of desert folk are known to have occurred from time to time, and that on one occasion, at any rate, the tribes from Central Asia and those from the desert of Arabia simultaneously spread devastation to the west, and were instrumental in the final destruction of the Roman Empire.

If we are right in attributing the destruction of Hissarlik II. to the nomad steppe-folk of South Russia, we are here dealing with the results of one of these periods of drought, and we should find, if Mr. Ellsworth Huntington's view is correct, corresponding movements from other dry areas, which may perhaps enable us to date the event with greater precision.

Historians and comparative philologists are agreed that there have been four great irruptions of the people of Arabia into the surrounding regions, and that the descendants of these four sets of invaders can be distinguished as the peoples who speak or have spoken the four different groups of Semitic languages. Moreover, although the dates of these four irruptions cannot in every case be determined with precision, they can nevertheless be identified with certain historical events, which can be approximately if not accurately dated.³

The first or Akkadian invasion took place some time early in the third millenium B.C., perhaps even earlier, but the dates of this period are at present uncertain. Shar-Gani-sharri, King of Akkad, popularly known as Sargon of Agade, whose reign is believed to have extended from about 2650 B.C. to about 2600 B.C., is generally believed to have been the first ruler of the Mesopotamian kingdom founded by these invaders, but, as Mr. King has shown,⁴ it is probable that the kings of Kish, who preceded him, were of the same race. This will put back the date of the invasion to about 2750 B.C., when Sharru-Gi became king of Kish, and it is quite possible that further evidence may some day be found which will necessitate this date being placed still farther back. The second, or Canaanite invasion, which took place in the latter half of the third millenium, seems to be that which was contemporary with the steppe-folk raid with which we are dealing, and the evidence for this merits closer inquiry. The third, or Aramæan invasion, began about 1350 B.C., and these marauders were a serious menace to Shalmaneser I., about 1300 B.C.⁵ The fourth, or Arabian invasion, started soon after the death of Mohammed in A.D. 632.

¹ Ellsworth Huntington, *The Pulse of Asia*.

² Ellsworth Huntington, *Palestine and its Transformation*.

³ Myres, J. L., *The Dawn of History*, pp. 104-19.

⁴ King, L. W., *A History of Sumer and Akkad*, p. 215.

⁵ Myres, J. L., *op. cit.*, p. 117.

The second or Canaanite invasion is believed first to have affected Syria and Palestine, and perhaps to have been responsible for the introduction of metal into the latter country.¹ At the same time, or soon afterwards, the invaders arrived in Mesopotamia, where they established the first Babylonian Dynasty at a date recently fixed by Mr. King at 2225 B.C.² If this date can be depended upon, and it seems that the margin of doubt is not more than 5 or 10 years, we have valuable evidence which will enable us to fix the date that we require. It is in remarkable agreement with the evidence afforded by the "Treasure of Priam."

Let us now turn to Egypt, the source of our basis for chronology. Mr. Ellsworth Huntington has suggested that the period between the Old and Middle Kingdoms was one of weakness, perhaps due to raids from the desert folk on the border,³ but no historians of Egypt give any evidence of such raids. Dr. Alan Gardiner, however, has shown that in some recently discovered papyri the required evidence may be found, and that there was a raid about this time across the Sinaitic Peninsula, and that the invaders took possession of the Delta, while the Egyptian government moved southwards to Heracleopolis.⁴ The dates of this period are particularly uncertain, but Professor Breasted fixes the beginning of the ninth dynasty, the first of the two that governed from Heracleopolis, provisionally at 2445 B.C. Some Egyptologists believe that this date may have to be brought down a little, and on geographical grounds we may consider it likely that this invasion was the first step in the move that led later to the invasion of Palestine and Syria, and the foundation of the first Babylonian Dynasty.⁵

Lastly there is some evidence of a fourth movement of peoples about this time, and from a more unexpected quarter, namely, the traditions of the Chinese. The late Professor Terrien de Lacouperie, while studying the early connections between the Chinese and other nations, came to some remarkable conclusions.⁶ So unexpected were they, that they were received by most Sinologists with ridicule; but a careful scrutiny of the criticisms directed against this theory at the time shows that the critics had misunderstood much of the evidence with which they were dealing, which is not altogether surprising, as Professor de Lacouperie had been writing in a foreign language, and had not the gift of clear exposition. The late Sir Robert Douglas was, however, an exception, and in a work published in 1889 he accepted the theory as established "with many incontestable proofs."

¹ Macalister, R. A. S., *A History of Civilization in Palestine*, p. 31.

² King, L. W., *History of Babylonia*:—as the result of information furnished by Professor Clay from the Yale Tablets, Mr. King substitutes this date for 2150 B.C., suggested in his former volume.

³ Ellsworth Huntington, *Palestine and its Transformation*, p. 382.

⁴ Gardiner, A. H., "New Literary Works from Ancient Egypt," *Journal of Egyptian Archaeology*, i, part i; *The Admonitions of an Egyptian Sage*.

⁵ Cf. Myres, J. L., *op. cit.*, pp. 113-17.

⁶ Terrien de Lacouperie, A. E. J. B., *Languages of China before the Chinese; Western Origin of early Chinese Civilization*.

The theory, in brief, is, in Sir Robert's words, "that they (the ancestors of the Chinese) had migrated eastward from a region south of the Caspian Sea in about the twenty-third century B.C."¹ Here, then, we have another case of a migration of people occupying pasture lands in the steppe region of Asia, this time to the east, but very close on the date we are dealing with.

By comparing all these theories, we seem to arrive at the following conclusion. That a period of drought, beginning about 2450 B.C., or more probably later, caused desert tribes from Arabia to pass across the Sinaitic Peninsula and occupy the Delta, while later waves invaded successively Palestine and Syria, introducing the knowledge of metal, perhaps gained from their kindred in Egypt, and founding the city of Damascus. Later they set out from the latter city across the desert and by degrees settled in Babylonia and perhaps Assyria, while in the former country they established a permanent dynasty in 2225 B.C.

Meantime, about 2300 B.C. or soon after, the drought was being felt on the steppes on both sides of the Caspian Sea. This caused the Bak tribes, an unwarlike race, to move off to the north-east in search of fresh pastures, and as these were not to be found abundant in Central Asia, they arrived eventually in China, where they founded an empire in 2000 B.C. Later on the Nordic steppe-folk on either side of the Volga found their pasturage diminishing. Some, no doubt, occupied the lands set free by the departure of the Bak tribes,—perhaps they caused their departure,—and thence penetrated the plateau of Persia, where we find them a few centuries later as Kassites. Others crossed the Dnieper, destroyed the Tripolji culture and overran Galicia and Roumania. Subsequently some burst through the Carpathians into Hungary, while others crossed the Danube into Thrace. The latter divided into two groups: one, skirting the coast, passed into Thessaly and occupied the plain of Larissa, while the other party passed from the Gallipoli Peninsula across the Hellespont, destroyed Hissarlik II., and went on to the grass lands of the central Anatolian table-land. Whether these latter appear shortly afterwards farther south as Amurri or Amorites, or survive to the present day as Kurds, are interesting points not yet capable of proof.

¹ Douglas, Robert K., *The Story of China*, p. 3.



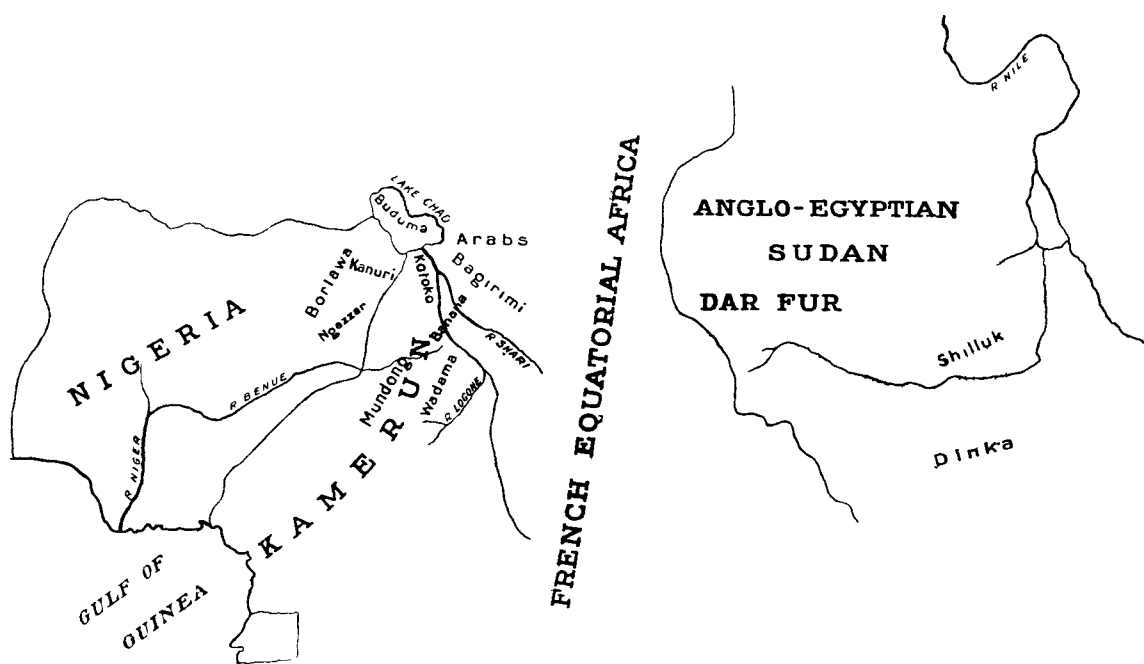
MAP 2.—DISTRIBUTION OF RACES DURING AND AFTER THE RAIDS.
RACIAL ELEMENTS CONCERNED IN THE FIRST SIEGE OF TROY.

NOTES ON THE ANTHROPOMETRY OF SOME CENTRAL SUDAN TRIBES.

[WITH PLATES VI-IX.]

By P. AMAURY TALBOT.

THE measurements, below given, are of males, in medium condition, belonging to some of the more important Central African peoples. Owing to the hurried nature of our journey it was unfortunately impossible to obtain as large a number of each as could have been wished; while, in some cases, when the people had hardly ever before seen a white man, they showed deep suspicion as to the nature of the "magic" which it was proposed to perform upon their heads.



DISTRIBUTION OF THE TRIBES.

With the exception of the pagan Banana, Wadama, Mundong and Kumbra, all the races studied were more or less Mohammedanized.

A summary of the most important measurements and indices is given, to which have been added those already published in the *Journ. Roy. Anthropol. Inst.*, vol. xli, 1911. (See Tables I and II.)

For the sake of comparison, measurements of other African peoples are attached :—

People.				C.I.	N.I.	U.F.I.	Authority.
Egyptians. Nakada (prehistoric)				73·6	(1·6 allowance for flesh.)		Myers.
„ (modern) Kena & Girga				74·1			„
„ „ Moslems ...				74·3	75·6	48·4	„
„ „ Copts...				74·0	75·8	48·6	„
„ „ Mixed ...				74·1	79·4	48·1	„
17 Dinka ...				72·7	99·0	46·2	Tucker and Myers.
11 Shilluk ...				71·7	93·3	47·1	„ „
20 Nubawi ...				76·2	101·2	46·7	„ „
7 Tagalawi ...				79·1	103·2	44·4	„ „
18 Furawi ...				74·4	102·6	45·1	„ „
8 Bertawi ...				75·9	101·3	46·1	„ „
107 Berbers ...				77·3	69·7		Randall-MacIver and Wilkins.
184 Kabyles ...				76·4	66·5		Prengrueber.
180 Berbers of Biskra ...				76·7			Quoted by Topinard.

TABLE I.—SUMMARY OF MEASUREMENTS AND INDICES.

No.	Tribe.	Head.			Face.			Nose.			St.	Sp.	Ind.
		L.	B.	Ind.	L.	B.	U.F. Ind.	L.	B.	Ind.			
4	Kanembu ...	197	142	71·7	64	140	45·9	48	44	92·7	1760	1810	50
32	Buduma ...	192	139	72·3	65	138	47·1	45	44	97·9	1742	1873	131
20	Kotoko ...	193	142	73·9	65	138	46·9	45	46	102·0	1806	1917	111
19	Arabs ...	192	144	74·9	66	139	47·5	48	45	92·6	1747	1841	94
21	Bagirimi ...	197	146	74·1	66	140	47·4	48	47	97·7	1762	1862	100
20	Borlawa ...	191	142	74·2	65	136	47·5	44	44	99·3	1701	1815	114
18	Kanuri ...	189	141	74·5	62	133	46·8	44	44	98·4	1667	1769	102
20	Ngassar ...	194	144	74·6	64	137	47·0	45	45	100·7	1757	1863	106
11	Banana ...	191	148	77·3	65	142	45·5	45	47	103·2	1785	1857	102
21	Wadama ...	189	147	78·0	61	140	43·7	44	44	101·3	1742	1851	109
20	Mundöng ...	194	143	73·8	62	141	44·1	44	45	103·0	1723	1825	102
9	Kumbra ...	188	160	85·2				49	44	89·1	1831	1897	66

From the above measurements it would seem that the following deductions may be drawn:—

(1) There would appear to be a close connection between the Bagirimi, Borlawa (Fikans) and Kanuri, although among all three, especially the last-named, there has been a great admixture of foreign blood from the north. A very ancient Borlawa tradition states that all three tribes originally came from Yemen, in Arabia, but, owing to quarrels over hunting rites, separated on reaching the River Shari. The wooden throwing weapons in present-day use among the Bagirimi are exactly similar to those found in ancient Egyptian tombs, while the ceremonial double-headed axes used for religious purposes recall those of the Mediterranean area, and will be described in detail later.

(2) The Ngassar also seem akin to the above. They state that they have lived in their present territory for about 300 years, and there is a strong tradition among them that they originally came from near Constantinople.

(3) The Kotoko—perhaps the tallest race in Africa—are, according to legend, closely connected with the Buduma, though the nasal index seems to show a much greater admixture of negro blood. Their measurements are almost identical with those of the Furawi. On the other side the Buduma are near akin to the Kanembu.

(4) There seems little doubt but that (*a*) the original stock of all the above-mentioned tribes came from the East, many of them in comparatively modern times; that (*b*) negro and Hamitic strains predominate; and that (*c*) they are allied to the Nilotes, such as Dinka and Shilluk. Their common origin is further borne out by a similarity in customs and beliefs.

(5) The Arabs of this region, who are apparently not akin to any of their neighbours, state that they came from Fezzan during the last few hundred years.

(6) The Banana (Musgu) are a pagan negro race with slight Hamitic affinities. They have a strong artistic sense, and build the most beautiful houses of any negro tribe. According to some English authorities, this style of architecture shows the most perfect form of arch ever developed.

The Banana seem allied to their neighbours, the Wadama, a very black negro people of magnificent physical development.

(7) The Mundöng are another negro race among whom also a very interesting form of architecture has been evolved. They appear allied, on the one hand, to the Banana and Wadama, and, on the other, to the Kotoko. The Fulani, who swept like a conquering wave right up to this part of the world, are now intermarrying with them to a considerable extent.

(8) The Kumbra are a tall, finely developed, very round-headed tribe, of a type quite distinct from all others mentioned. Their country, so far as could be gathered, appears to lie about 200 miles east of the Central Logone.

* * * * *

It is a matter of regret that, owing to pressure of other work, it has been impossible to elaborate the statistics given; but, on the chance that they might be of use to inquirers, it seemed better to publish them without further delay.

DETAILS OF MEASUREMENTS OF INDIVIDUALS.

1. BAGIRIMI (Town, Abugher, except 18 to 21, Ngama).

No.	Name.	Age.	Head breadth.	Head length.	Bizyg.	Nasal breadth.	Nas. to alveolar.	Nas. to septum.	Nas. to chin.	Vertex to tragus.	⊙	Height.	Span.
1	Goni ...	60	146	193	141	52	66	52	123	125	538	1813	1961
2	Mahomed...	65	147	197	133	43	63	51	115	124	559	1689	1808
3	Kade ...	60	138	203	139	50	61	45	115	138	554	1808	1910
4	Hamara ...	60	152	211	142	51	64	48	116	133	582	1813	1857
5	Kadek ...	50	142	205	143	45	67	50	125	132	566	1737	1910
6	Debro ...	50	144	207	142	60	68	51	127	127	554	1762	1882
7	Kadra ...	70	153	203	138	42	68	52	120	135	577	1712	1813
8	Mahomed...	65	139	188	130	54	72	50	129	128	541	1712	1798
9	Musa ...	40	146	189	135	44	70	50	119	126	546	1670	1788
10	Jabai ...	50	141	191	134	43	68	43	113	124	528	1780	1875
11	Dibiri ...	40	154	198	147	49	54	44	106	134	574	1867	1944
12	Esseenn ...	50	146	196	133	44	67	45	124	125	544	1747	1808
13	Seenni ...	35	142	185	145	43	68	47	116	128	533	1712	1922
14	Isa... ...	40	139	208	142	44	62	43	118	136	566	1805	1937
15	Abdul Mohmoud	45	147	197	134	50	66	49	115	120	554	1668	1798
16	Isa... ...	55	148	203	145	47	69	52	124	130	571	1747	1854
17	Dejiri ...	40	145	188	142	45	68	50	115	127	544	1808	1930
18	Dalema ...	48	155	197	147	45	72	50	112	122	561	1765	1860
19	Kadamaidola ...	50	147	202	142	50	69	50	125	131	554	1882	1912
20	Kadabio ...	50	142	188	140	47	56	43	108	128	541	1620	1668
21	Jirma ...	48	148	184	141	42	72	48	118	132	533	1862	1860
Total 21	Average ...	51	146	197	140	47	66	48	118	129	553	1761	1862

2. BORLAWA (Fikans, Town Fika).

No.	Name.	Age.	Head breadth.	Head length.	Bizyg.	Nasal breadth.	Nas. to alveolar.	Nas. to septum.	Nas. to chin.	Vertex to tragus.	⊙	Height.	Span.
1	Bukar ...	30	137	192	133	44	65	47	118	126	541	1747	1899
2	Mallambege ...	45	139	193	127	41	67	49	119	120	554	1762	1890
3	Maidaua ...	35	147	193	139	38	68	46	112	126	554	1684	1810
4	Sambo ...	35	143	186	136	46	74	50	117	120	551	1653	1770
5	Bakara ...	40	142	190	138	47	64	38	116	126	541	1757	1849
6	Alikar ...	45	145	193	138	45	66	45	117	125	559	1836	1976
7	Kangadi ...	45	142	191	141	46	65	42	108	129	546	1732	1854
8	Maiana ...	35	137	188	133	50	60	41	104	124	541	1729	1767
9	Kogi ...	45	136	196	135	45	68	48	119	129	541	1737	1867
10	Yada ...	30	138	200	131	42	68	45	118	125	556	1803	1899
11	Wasiri ...	30	148	196	133	44	67	48	115	120	566	1681	1747
12	Maragi ...	25	133	186	133	39	64	41	104	114	526	1634	1762
13	Gargui ...	24	146	188	140	43	63	45	111	124	566	1678	1788
14	Baba ...	25	148	201	132	45	66	43	108	124	569	1704	1818
15	Momudu ...	28	146	183	131	40	63	46	106	117	541	1585	1684
16	Bali ...	28	143	183	129	42	56	37	108	115	538	1686	1813
17	Baii ...	30	147	192	141	46	55	43	107	120	564	1602	1620
18	Daiero ...	40	144	193	134	47	64	42	117	127	551	1656	1729
19	Bauana ...	35	138	188	138	42	60	41	105	124	541	1762	1888
20	Wuba ...	40	144	197	153	46	68	47	124	131	571	1757	1902
Total 20	Average ...	35	142	191	136	44	65	44	113	123	551	1709	1817

3. NGASSAR (Town, Ngassar).

No.	Name.	Age.	Head breadth.	Head length.	Bizyg.	Nasal breadth.	Nas. to alveolar.	Nas. to septum.	Nas. to chin.	Vertex to tragus.	⊙	Height.	Span.
1	Ma Burra...	... 40	136	190	133	43	65	45	108	132	541	1783	1854
2	Ma Kama	... 50	146	198	142	43	58	41	115	135	566	1798	1976
3	Bukar ...	... 35	144	201	139	48	65	45	110	130	566	1757	1798
4	San Tama	... 50	144	202	141	47	61	46	110	133	571	1831	1910
5	Gobie ...	... 40	143	188	137	46	68	44	113	121	551	1734	1875
6	Mani ...	... 40	145	197	140	48	69	45	116	127	554	1762	1849
7	Morima ...	... 48	141	196	130	45	63	46	106	128	554	1714	1791
8	Maidugu ...	... 46	146	193	128	43	62	46	110	119	533	1783	1875
9	Geriwa ...	... 50	151	193	145	49	60	48	112	132	564	1709	1833
10	Ali...	... 50	141	195	132	47	62	44	107	130	546	1844	1996
11	Kussa ...	... 45	145	199	139	49	63	42	107	126	564	1757	1950
12	Adiwa ...	... 40	142	186	138	44	63	45	112	122	544	1714	1870
13	Asa ...	... 40	136	194	135	38	67	46	109	118	544	1860	1961
14	Mahmud ...	... 40	147	192	139	46	63	47	104	121	554	1760	1882
15	Maikelu ...	... 25	149	191	138	44	66	46	110	124	538	1632	1709
16	Kegamu ...	... 48	151	194	136	44	69	43	105	108	569	1717	1778
17	Arain ...	... 50	140	194	134	41	69	45	112	122	546	1709	1803
18	Galadima	... 25	148	193	138	42	66	46	114	124	566	1785	1890
19	Mama ...	... 45	144	191	135	43	62	47	114	121	544	1709	1757
20	Mataba ...	... 50	146	188	138	44	63	41	107	127	549	1783	1899
Total 20	Average	... 43	144	194	137	45	64	45	110	125	553	1757	1863

4. BANANA (Town, Kumi).

No.	Name.		Age.	Head breadth.	Head length.	Bizyg.	Nasal breadth.	Nas. to alveolar.	Nas. to septum.	Nas. to chin.	Vertex to tragus.	⊙	Height.	Span.
1	Afala	...	50	158	197	146	46	61	48	118	128	561	1780	1849
2	Boila	...	50	148	193	147	54	68	46	129	132	551	1950	1976
3	Chowoo	...	45	147	198	145	48	63	45	109	124	566	1752	1818
4	Aleina	...	50	149	197	145	47	65	51	117	131	561	1917	1976
5	Idigetke	...	20	149	182	131	43	67	46	116	117	541	1712	1760
6	Siana	...	47	142	181	137	44	64	42	108	118	533	1747	1803
7	Wudamgwoila	...	35	150	196	147	42	69	45	118	136	577	1742	1798
8	Fandarong	...	47	146	185	140	48	59	43	104	123	546	1788	1937
9	Agalala	...	40	142	193	142	48	70	42	120	123	551	1833	1892
10	Chugula	...	45	145	191	142	45	57	39	113	125	551	1675	1760
11	Yapdo	...	50	147	186	143	46	66	44	111	120	551	1744	1890
Total 11	Average	...	44	148	191	142	46	64	45	115	125	554	1785	1860

5. WADAMA (Town, Kerra).

No.	Name.	Age.	Head breadth.	Head length.	Bizyg.	Nasal breadth.	Nas. to alveolar.	Nas. to septum.	Nas. to chin.	Vertex to tragus.	⊙	Height.	Span.
1	Bagado ...	30	147	185	140	50	56	42	109	122	—	—	—
2	Bagado ...	33	142	176	134	43	56	39	105	110	520	1647	1818
3	Kaiyipala (chief)...	50	148	194	138	46	71	53	125	128	569	1854	1976
4	Mitenji ...	34	149	203	143	48	63	44	109	123	554	1833	1956
5	Dangama ...	45	154	185	139	44	62	45	112	115	541	1707	1767
6	Fundigado ...	55	144	188	137	42	59	41	117	121	541	1757	1905
7	Sube ...	53	150	188	142	47	70	48	119	126	544	1722	1791
8	Wolba ...	45	158	188	147	43	62	45	116	120	554	1862	1932
9	Kapi ...	28	153	187	150	47	64	43	108	126	541	1670	1839
10	Joravell ...	35	151	180	138	43	60	46	117	119	526	1860	1976
11	Afedijilo ...	40	147	191	138	42	58	47	108	119	541	1722	1875
12	Dangabidi ...	27	146	191	137	42	57	41	107	122	541	1739	1885
13	Namasu ...	50	143	197	142	41	64	47	119	123	551	1704	1823
14	Osuna ...	44	149	188	140	47	60	45	104	118	546	1805	1841
15	Dumolonji ...	50	143	183	138	46	63	40	112	127	533	1595	1744
16	Kalamduna ...	55	148	191	143	44	56	42	113	120	536	1760	1857
17	Salenji ...	38	149	204	148	44	65	48	116	127	577	1760	1823
18	Sumdungi...	20	136	193	138	45	57	37	104	121	541	1661	1712
19	Dommigidda ...	20	148	188	142	41	60	42	111	118	544	1717	1727
20	Cherengi ...	20	143	187	128	41	60	42	104	116	541	1639	1847
21	Tusigidda...	25	147	180	130	43	58	40	101	108	528	1829	1925
Total 21	Average ...	38	147	189	140	44	61	44	111	120	543	1742	1851

6. MUNDONG (Town, Lere).

No.	Name.	Age.	Head breadth.	Head length.	Bizyg.	Nasal breadth.	Nas. to alveolar.	Nas. to septum.	Nas. to chin.	Vertex to tragus.	☉	Height.	Span.
1	Bugomik ...	26	140	192	142	45	69	47	111	119	544	1796	1927
2	Zina ...	35	152	193	142	51	57	38	102	115	569	1805	1882
3	Kanevvi ...	30	143	188	142	42	55	42	102	117	544	1867	1932
4	Jadderre ...	25	145	200	143	43	67	45	121	121	564	1696	1865
5	Ngeba ...	24	147	193	132	46	52	42	101	115	556	1673	1796
6	Dilong ...	38	141	207	140	43	61	41	100	123	571	1755	1875
7	Waiyichelli ...	40	139	200	137	41	67	50	121	126	549	1732	1841
8	Kagenni ...	24	137	193	134	50	62	39	104	114	538	1707	1833
9	Bachar ...	20	137	191	141	46	61	46	117	120	538	1656	1752
10	Makwaia ...	40	147	185	143	46	63	51	115	119	534	1729	1773
11	Kurabi ...	35	142	195	145	47	63	49	108	121	549	1661	1820
12	Jongvoni ...	38	149	205	155	49	68	48	123	127	554	1788	1910
13	Too ...	43	142	193	142	47	61	45	111	122	538	1872	1937
14	Baindi ...	40	145	191	147	42	62	43	104	116	546	1709	1890
15	Barri ...	40	151	193	137	45	63	40	98	115	551	1725	1803
16	Dmbe ...	35	147	203	144	47	55	39	99	126	564	1770	1839
17	Arangbi ...	40	138	188	138	46	66	46	109	120	538	1647	1670
18	Pernu ...	20	140	188	135	43	61	43	104	118	538	1641	1798
19	Ozawali ...	45	137	197	134	45	62	40	109	116	528	1629	1686
20	Nanne ...	25	142	182	142	39	66	44	115	118	533	1626	1670
Total 20	Average ...	33	143	194	141	45	62	44	109	119	547	1724	1825



FIG. 1.—KOTOKO TYPES.

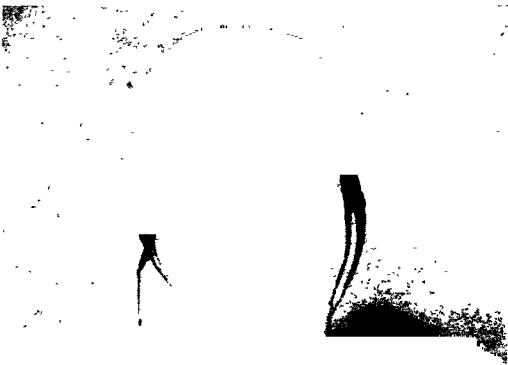


FIG. 2.—KOTOKO WOMAN.



FIG. 3.—ARAB MAN, FRENCH CENTRAL AFRICA.

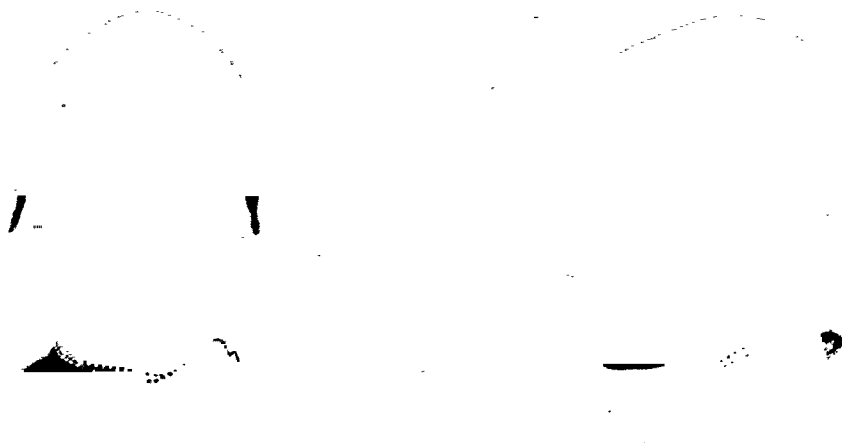


FIG. 1.—FIKAN (BORLAWA) WOMAN. (Full face.)

FIG. 2.—FIKAN (BORLAWA) WOMAN. (Side face.)

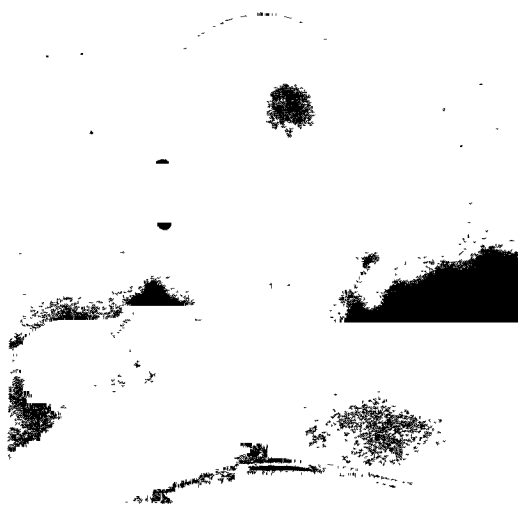


FIG. 3.—TUBURI MAN, FRENCH CENTRAL AFRICA.



FIG. 1.—MUNDÖNG WOMEN AT BIPARE,
N. CAMEROON.

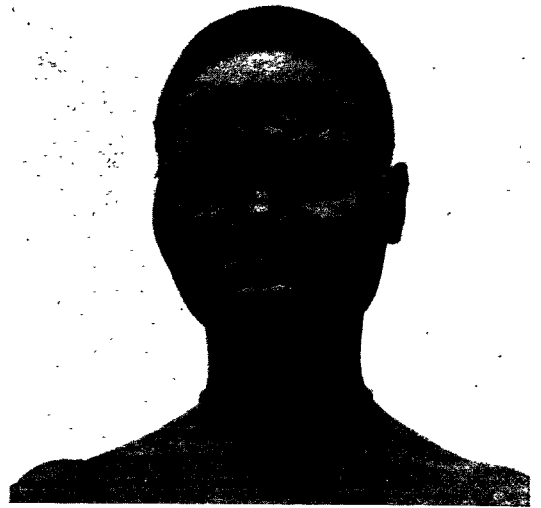


FIG. 2.—MUNDÖNG WOMAN, N. CAMEROON.



FIG. 3.—WADAMA MAN, TUBURI LAKES,
FRENCH CENTRAL AFRICA.

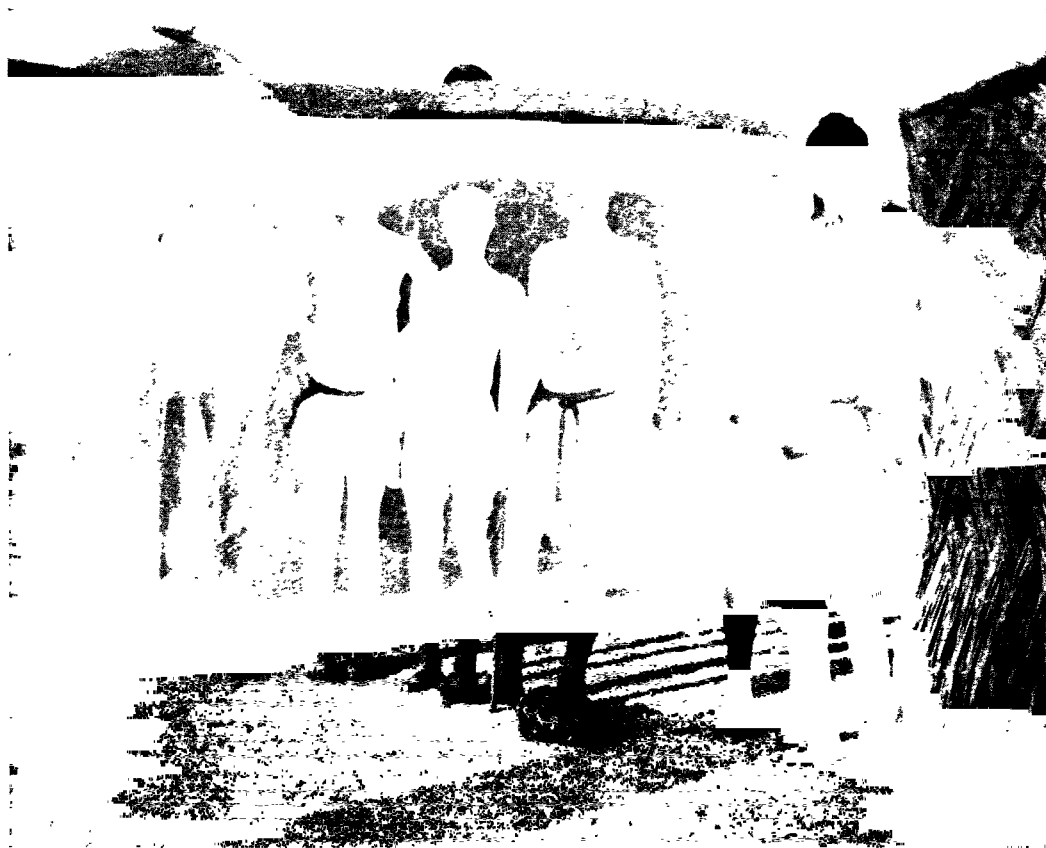


FIG. 1.—TYPES OF KUMBRA, FRENCH CENTRAL AFRICA.



FIGS. 2 AND 3.—BANANA MEN, R. LOGONE, FRENCH CENTRAL AFRICA.

ON THE ANTHROPOMETRY OF SOME CENTRAL SUDAN TRIBES.

7. KUMBRA.

No.	Name.	Age.	Head breadth.	Head length.	Bizyg.	Nasal breadth.	Nas. to alveolar.	Nas. to septum.	Nas. to chin.	Vertex to tragus.	⊙	Height.	Span.
1	Nadunga ...	35	163	195	156	45	—	54	120	126	577	1917	1998
2	Jimminga ...	35	158	192	146	40	—	47	124	129	564	1885	1998
3	Ngarian ...	38	161	197	147	47	—	53	124	132	546	1877	1950
4	Bangwadidgi ...	40	162	191	149	46	—	49	125	131	566	1875	1953
5	Nujive ...	36	146	190	136	39	—	51	121	119	551	1803	1875
6	Donnga ...	38	150	180	139	39	—	42	110	119	534	1675	1739
7	Morgana ...	28	149	194	143	46	—	45	112	126	561	1767	1875
8	Kulamaji ...	30	160	193	154	46	—	48	116	130	571	1815	1905
9	Naitera ...	30	189	155	146	44	—	50	115	129	554	1870	1778
Total 9	Average ...	34	160	187	146	44	—	49	119	127	558	1832	1897

EVOLUTION IN MAORI ART.

[WITH PLATE X.]

By H. D. SKINNER.

INTRODUCTION.

THE following studies on the origin and development of various forms of Maori pendant, and of the *mere*, were undertaken as the first step towards elucidating the history and affinities of Maori art as a whole. It is believed that the method followed—that of tracing out the ancestral forms of the simplest decorative designs and working from them towards the far more complex problems presented by the great wood carvings—will yield more reliable results than any other method. Events forbade the finishing of the task, and the studies are presented as a fragment.

The conclusion reached by the writer is that Maori art in its most characteristic forms is native to New Zealand. Some of the motifs are derived from Melanesia, notably the human figure with the two supporting bird-headed *manaias*, a design recurring with endless variations through the whole field of Maori carving. To the same region may be traced the love of scroll patterns in carving and decorative painting. From Polynesia were apparently derived the perfection of execution, the technical skill, and the tendency towards repetition and symmetrical balance which mark the Maori artist. The fusion of these two diverse elements produced a vigorous and fertile native art, derived from Melanesia and Polynesia but marked by new and distinctive characteristics of its own. It is with these two Oceanic areas, and not, as is often confidently asserted, with India and Eastern Asia or with America, that Maori art is most closely connected.

In a paper published in *Man*,¹ the present writer has traced the ancestry of the J-shaped pendant called *tau-tau* and proved it a native New Zealand form. In two papers of the following series, a similar origin and descent is traced for the straight and the curved types of pendants. Each of them originated in an object of practical use, and each developed through a series of closely similar forms into a type of pure ornament showing little resemblance to the implement from which it originally sprang. In the case of the *hei-tiki* and of the *peka-peka*, we shall see reason to believe that a foreign element is involved and that this element is Melanesian.

In each case the evolution of the ornament and the shape ultimately evolved has been profoundly affected by the material—greenstone—in which the work was generally executed.

¹ Vol. xv, No. 1, Article 2. This paper was by error attributed to Mr. Elsdon Best.

ORIGIN AND RELATIONSHIP OF PATU, ONEWA, AND MERE.

In all large collections of Maori antiquities there are to be seen specimens of the spatulate weapon to which the generic name *patu* was given. They range in length from 20 inches to 9 or 10. In outline they vary greatly, and this variability is specially pronounced in those types which are made of whalebone or of wood. Some are completely covered with intricate and beautiful carving, while others are perfectly plain. The *onewa* may be taken as the typical shape, but many of the wooden and whalebone specimens are in outline like a fiddle. From this shape further development has produced a fantastic type in which part of the cutting edge is lost altogether, its place being taken by a grotesque figure with arched back and protruding tongue.

Common features in all these forms are the narrow neck or grip which expands into the blade, the flat blade, its flatness varying according to strength of material, and the cutting edge around the most expanded part of the blade at the distal end. This last feature is specially noteworthy. Though the striking or cutting edge of the *onewa* and the *mere* extends from the distal end round either side to the grip, this is not the case with the older and more primitive types. In these the cutting edge does not extend to the grip at all, but is confined to the distal end. From this we should conclude what we know on other grounds to be true, namely, that *patu* is not a club, as it is sometimes erroneously called,¹ nor developed from one, but a thrusting or stabbing weapon. Further consideration might lead us to the conclusion that the *patu* is designed for stabbing, not the body, but the head.

I believe the method of use varied little throughout New Zealand. Among the Taranaki tribe the flax or leather thong is secured around the wrist and the weapon is grasped in the right hand. The left foot and shoulder are advanced towards the enemy and the left hand and fingers are vibrated with extraordinary rapidity: the knees are bent and the whole frame is tense, the eyes roll and the tongue is protruded to an extraordinary length: suddenly the warrior sidles crab-like half a dozen yards towards the enemy: then as suddenly he swings round, using his left foot as a pivot, bringing his right side forward, the weapon ready for the blow: with a whinnying scream the sidelong advance is continued until the opponent is engaged. The stroke is not actually horizontal, but an uppish thrust delivered with the action of a round-arm bowler and generally aimed at the temple. Fig. 1 gives a good idea of it. The individual whose skull is shown in Fig. 2 has received such a blow and it has pierced his skull. He survived the stroke long enough for bone partly to close the gap.

¹ McMillan Brown, *Maori and Polynesian*, p. 169. "The *mere* is a modification of a club rather than a cutting weapon."



FIG. 1.—STROKE WITH MERE.

Illustrations to *Ancient History of the Maori*. By John White.

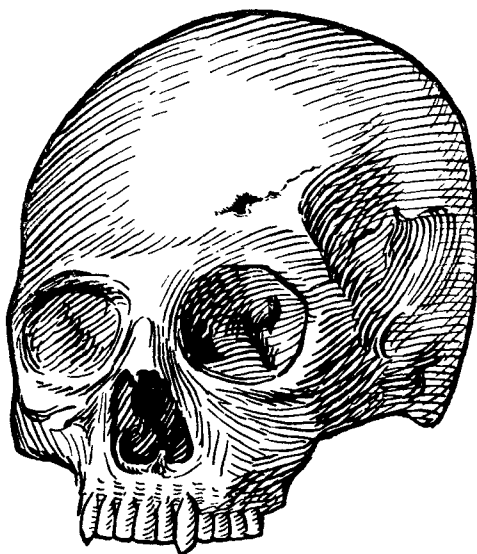


FIG. 2.—WOUND ON TEMPLE, RESULT OF STROKE WITH MERE.
Skull in the Museum of Nelson College.

Such was the proper blow with a *mere*, the only one, so far as is known, that was sanctioned by Maori honour. Doubtless in a tight corner a warrior would banish etiquette and deal what kind of blows he might, but such an action was disapproved.¹

The reason for this curious piece of military etiquette was first indicated many years ago by Lieut.-General Pitt-Rivers, who suggested that the ancestor of the *mere* was probably a stone celt or adze. The nature of such a weapon and the position of the cutting edge would limit the blows possible to a single one—the thrust at the head. The present paper is intended to supply the proof of Pitt-Rivers' theory and to indicate the relationship existing between the various species of *patu*. It is believed that the evidence brought forward will also throw light on some questions connected with the history of the Maori race.

The most beautiful of all the species of Maori adze is the *toki-pou-tangata* or killing adze. It is almost invariably made of greenstone, and is generally much thinner in cross-section than the ordinary working adze. When used as a weapon, it was sometimes hafted on a carved handle, but more generally it was used unhafted. Fig. 3 is a good example, having the proximal end shaped to hold the lashings which fastened it to the handle. When used unhafted this part would serve as a grip for the hand. For this type of weapon the only stroke possible is that already described as the characteristic stroke with the *mere*. Fig. 3A is another good example, the largest known to the writer.

Fig. 4 illustrates a slight advance in the direction of the *mere*. A small hole has been drilled in the *reke*, or poll, for suspension about the owner's neck when not in use. The notches on the edge (visible faintly on the side elevation) are also noteworthy. In Fig. 5 a hole for suspension drilled near the edge has broken, and a second hole has been drilled well down the blade. At this stage the leather thong securing the weapon to the wrist probably made its appearance. The notches (*whaka-taratara*) are probably decorative in purpose. There is no fixed number, but they generally occur in groups of three. I believe they took their origin from the transverse grooves for holding the flax binding sometimes seen on greenstone adzes. Fig. 6 shows such an adze with three grooves.

Fig. 7 is intended solely for use in the hand and can never have been hafted. The grip has developed and the notches are disappearing. In Fig. 8 the notches have disappeared and the grip has fully developed, though the weapon is still adze-shaped. In Fig. 9 the typical *mere* shape is emerging, although the cutting edge is still confined to the distal end. The *reke* or knob makes its first appearance. Fig. 10 is the *mere pounamu* fully developed, the cutting edges passing back on either side to the grip, and the *reke* symmetrical. Fig. 11 is an *onewa* (*patu* in black basalt) which exhibits the highest development reached by the Maori in the manufacture of stone *patu*.

¹ Since this was written I have seen a wooden *patu* in the Cambridge University Museum, which must have been used for a club blow. This is the only specimen of the kind known to me.

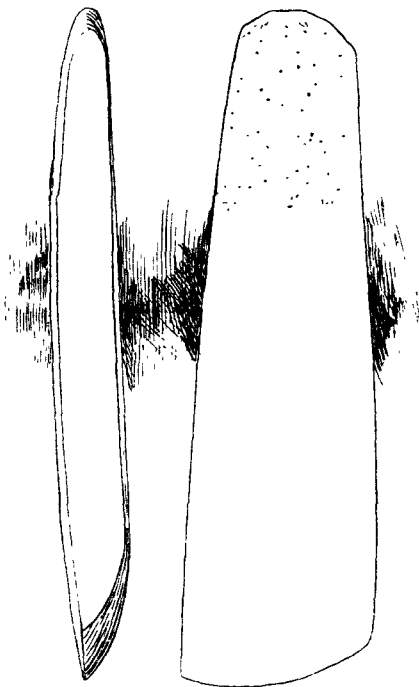


FIG. 3.—GREENSTONE ADZE. SKINNER COLLECTION. LENGTH $10\frac{1}{4}$ INCHES. GREENSTONE. LOC. TARANAKI.

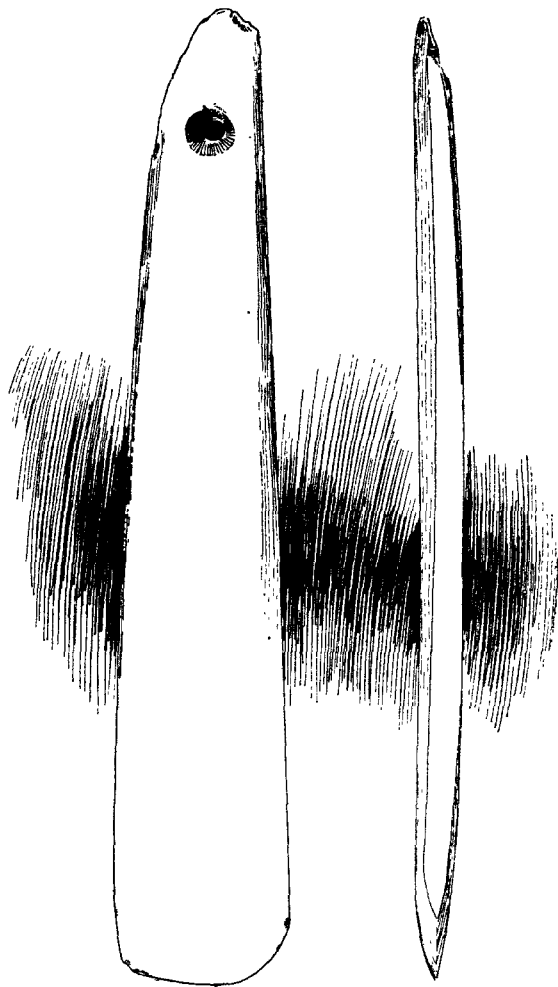


FIG. 3A.—TOKI-POU-TANGATA. SKINNER COLLECTION. LENGTH 15 INCHES. GREENSTONE. LOC. UNKNOWN.

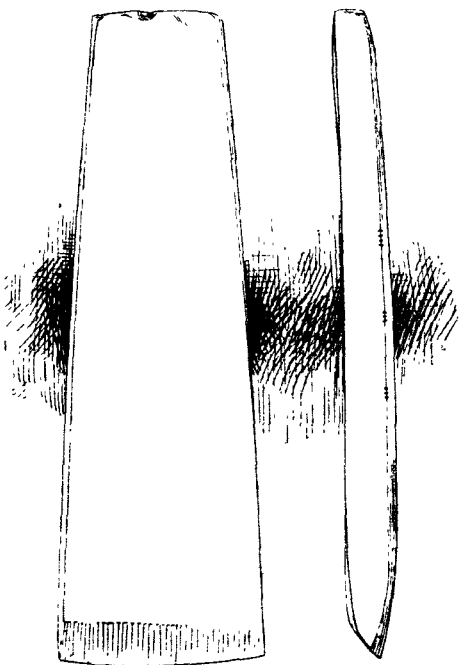


FIG. 4.—TOKI-POU-TANGATA. SKINNER COLLECTION. LENGTH 10 INCHES. GREENSTONE. LOC. UNKNOWN.

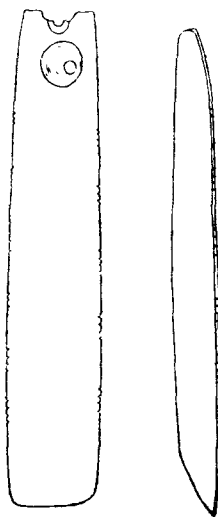


FIG. 5.—TOKI-POU-TANGATA. FELS COLLECTION. LENGTH $7\frac{1}{2}$ INCHES. GREENSTONE. LOC. WAIKATO.

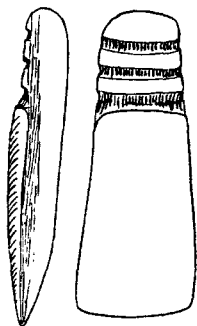


FIG. 6.—ADZE. SMITH COLLECTION (AUCKLAND MUSEUM). LENGTH $3\frac{1}{2}$ INCHES. GREENSTONE. LOC. NEAR DUNEDIN.

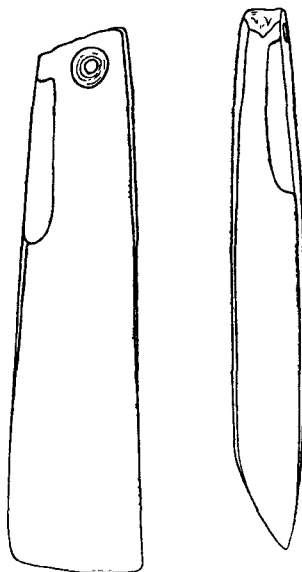


FIG. 7.—TOKI-POU-TANGATA. FELS COLLECTION. LENGTH 8 INCHES. GREENSTONE. LOC. NORTH AUCKLAND.

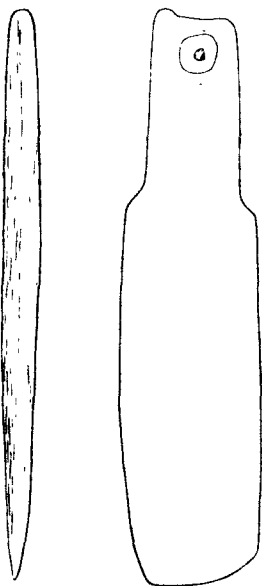


FIG. 8.—INTERMEDIATE FORM. BUDDLE COLLECTION. LENGTH $8\frac{1}{2}$ INCHES. LOC. PURAKANUI, OTAGO.

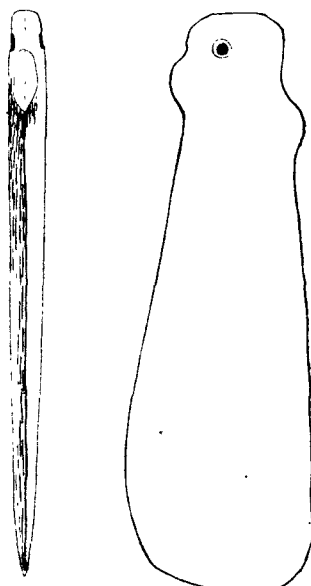


FIG. 9.—INTERMEDIATE FORM. SMITH COLLECTION (AUCKLAND MUSEUM). LENGTH $8\frac{1}{4}$ INCHES. GREENSTONE. LOC. OTAGO.

At this point a new and more tractable material comes into use, namely whalebone. Fig. 12 is a splendid specimen of whalebone *mere*, surpassing in execution and finish anything possible in stone. Fig. 13 (face and side view) represents a rare type from Otago. In the fragment A, the *reke* has divided into two, each part representing a bird, or *manaia* head. In the fine weapon, shown full length, these heads have become conventionalized into rounded knobs, in which, however, the eye

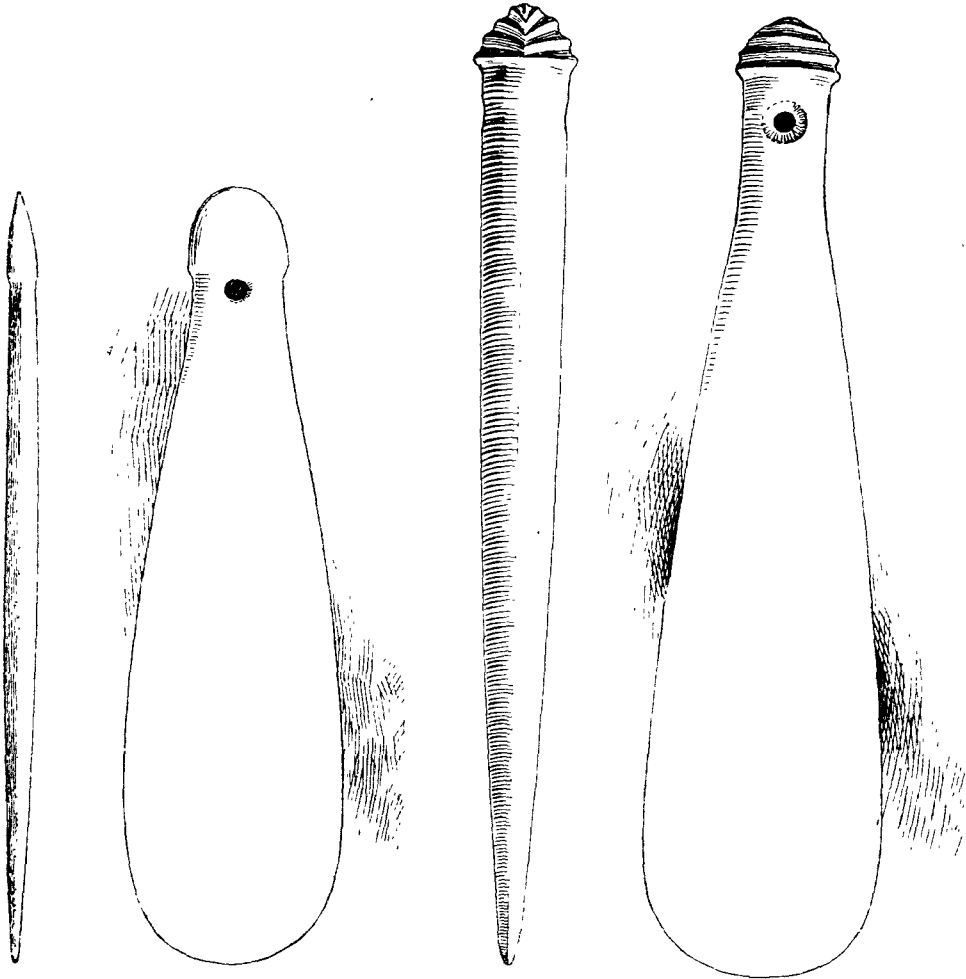


FIG. 10.—MERE POUNAMU. SKINNER COLLECTION. LENGTH $11\frac{3}{4}$ INCHES. GREENSTONE. LOC. TARANAKI.

FIG. 11.—ONEWA. SKINNER COLLECTION. LENGTH $14\frac{3}{4}$ INCHES BASALT. LOC. NORTH TARANAKI.

of the *manaia* is still indicated. Fig. 14 is a development of Fig. 12, having a head or *wehku* in place of the ridges on the knob, and a blade indented on both sides. The indentations are opposite holes through the blade. How little any part of the cutting edge except that at the distal end was used in fighting is proved by Fig. 15, a common type in which a human figure has been substituted for the cutting edge along two-thirds of one side. Name and significance of figure are lost, but I believe it was purely ornamental. Many theories have arisen as to the purpose of

the hole and indentation, some of which I hope to examine in a future paper. I believe that they are in purpose ornamental, that the primary element is the hole, and that the indentation is a secondary elaboration. Any function they performed

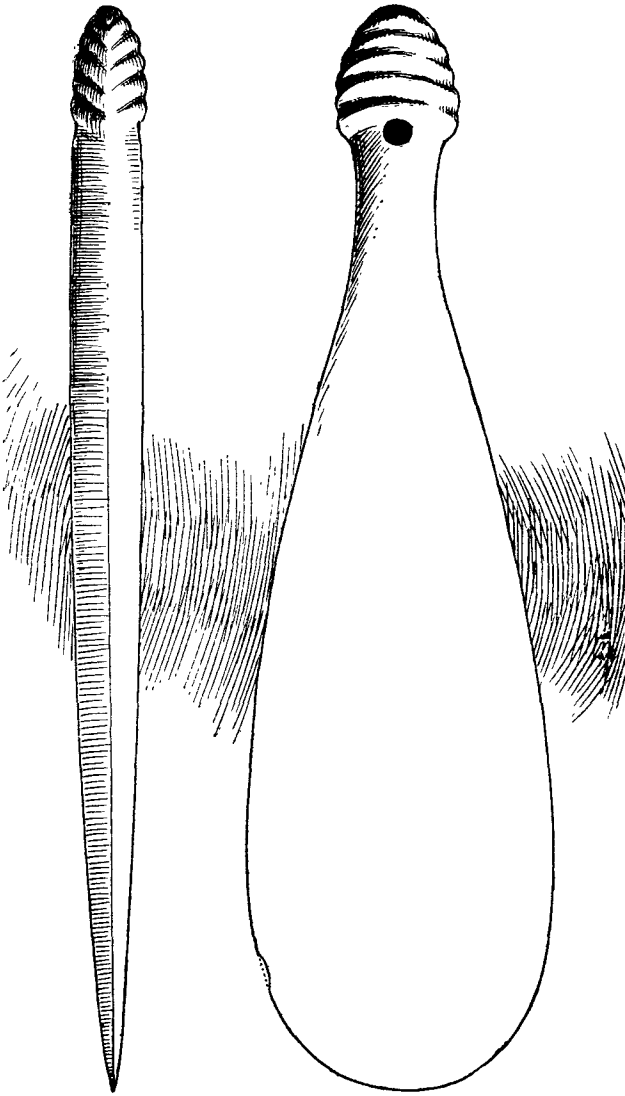


FIG. 12.—MERE PARAOA. SKINNER COLLECTION.
LENGTH 16 INCHES. WHALEBONE.
LOC. TARANAKI.

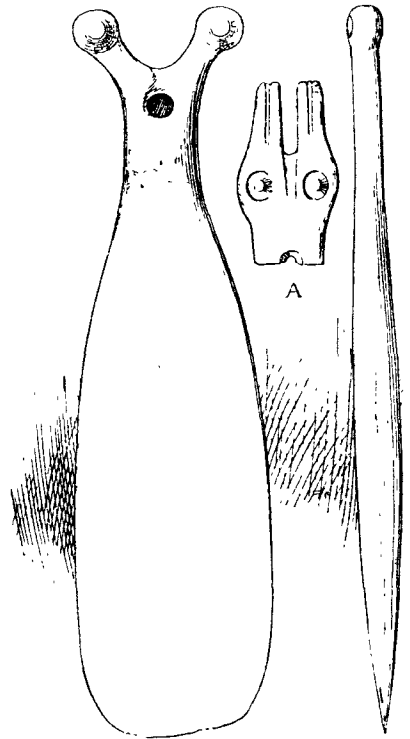


FIG. 13.—MERE PARAOA. LENGTH ABOUT
11½ INCHES. WHITE COLLECTION.
WHALEBONE. LOC. WARRINGTON.

apart from decoration was merely incidental. This conclusion arises principally from consideration of Fig. 16, the distal end of an unusual type of *patu* from Otago. Here the two holes are very near the cutting edge and are only large enough to pass threads through. It is probable that on ceremonial occasions a bunch of

feathers was attached to the weapon by each hole.¹ The holes must have seriously weakened the cutting edge. It is suggested that they were therefore moved to a less dangerous position and enlarged in size. Subsequently the indentation was added. Hamilton long ago pointed out² the frequency in Maori greenstone ornaments of an indentation in edge opposite a drilled hole. It is suggested that this is a parallel case. A further step in development resulted in the coalescence

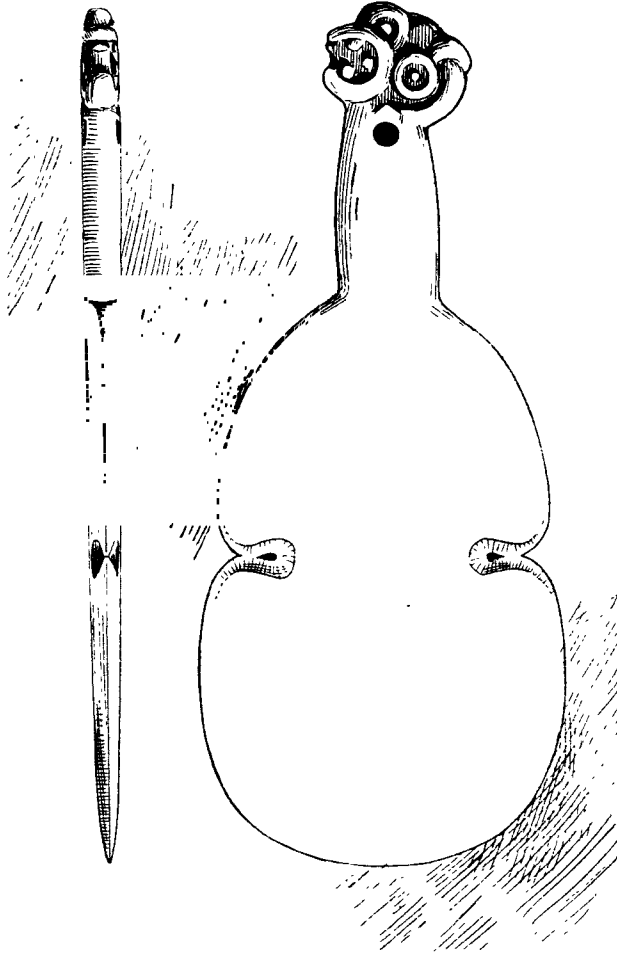


FIG. 14.—KOTIATE. SKINNER COLLECTION. LENGTH $13\frac{1}{8}$ INCHES. WHALEBONE. LOC. TARANAKI.

of notch and hole, a stage often seen in bone *patu* and less frequently in wooden ones. By a further refinement, probably rendered possible by steel saws, the two lobes sometimes overlap. (Fig. 17.)

¹ Since writing the above I have seen in the Cambridge University Museum a wooden specimen of the same type as Fig. 15. Near the end of the cutting edge, above the human figure, a small hole is drilled evidently for the suspension of a bunch of feathers. This love of feather decoration is one of the most noticeable features of Maori weapons.

² *Maori Art*, p. 342, Fig. 2.

All the types that occur in whalebone are also found in wood. Hamilton's statement that the true *mere* form does not occur in wood¹ is erroneous. There is in the Dominion Museum a wooden *mere*, the *reke* ridged and the blade beautifully carved, as is the case with almost all wooden *patu*.

It is believed that the specimens figured indicate the principal steps in the evolution of the more important subdivisions of the genus *patu*, and it is further

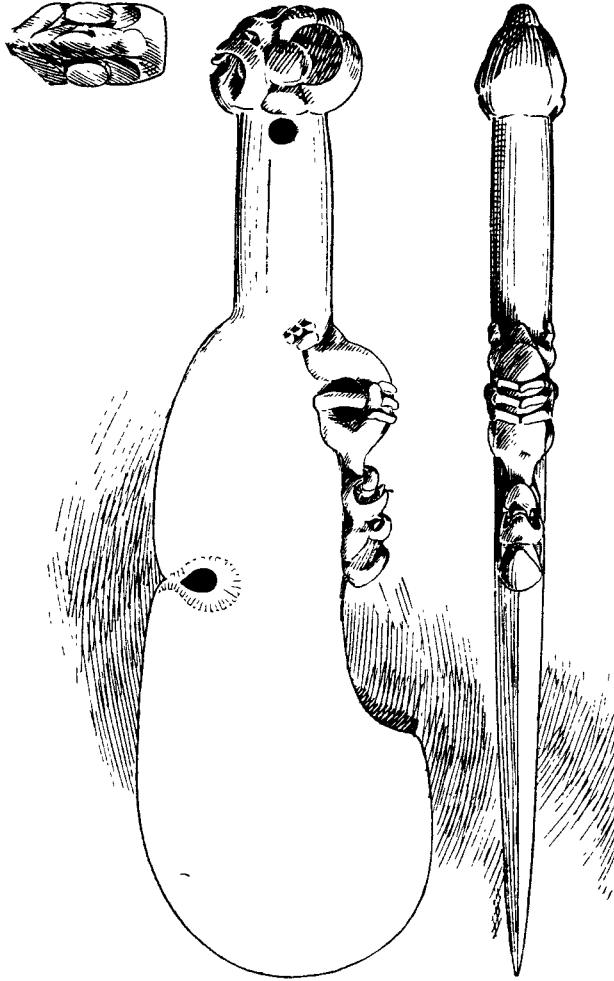


FIG. 15.—WAHA-IKA. SKINNER COLLECTION. LENGTH 15 INCHES. WHALEBONE. LOC. UNKNOWN.

believed that no important step is missing. Fig. 18 gives a clearer conception of that pedigree. The importance of the pedigree lies in the conclusion that must be drawn from it, namely, that the *mere* is native to New Zealand, and is not genetically connected with any weapon of similar shape found in other lands.

Neolithic Ireland produced a weapon which was a development of the adze or celt, but there is no evidence that it evolved further than a stage corresponding to

¹ *Ibid.*, p. 342.

that of Fig. 8.¹ It is possible that a type similar to this may have arisen in America or in the Pacific. But it is extremely unlikely that so specialized a form of the *patu* as the *onewa* or the *mere* has arisen elsewhere than among the Maoris. If a *mere* is found in the Society Islands² we must conclude that it came there from New Zealand. So also with the several cases reported from America,³ especially with the right-hand one of two specimens described and figured in the report of the United States National Museum for 1896. This one with its cord is an *onewa* down to the smallest decorative detail. Unless convincing proof of the process is brought forward it is impossible to believe that evolution can have produced, under conditions so different, results so exactly similar. The other specimen which is very dissimilar appears to be genuinely American and to have reached a stage corresponding to Fig. 8.

Further light is thrown on the history of the *patu* by the weapons of the Mori-ori of the Chatham Islands. Typical examples of the Mori-ori weapon called

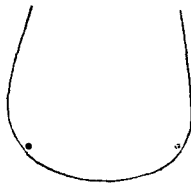


FIG. 16.—BLADE OF MERE PARAOA,
WITH HOLES FOR SUSPENSION OF
FEATHERS. WHITE COLLECTION.
LOC. OTAGO.

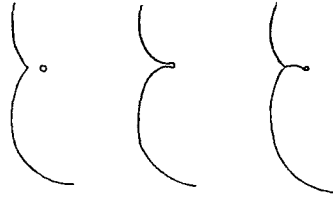


FIG. 17.—PROBABLE EVOLUTION OF
SHAPE OF BLADE OF KOTIATE.

okewa, a word closely allied to the Maori *onewa*, are represented by Figs. 19 and 20. Fig. 19 is notched along its distal edge, a feature which recalls the *whaka-tara-tara* and proves, if proof were needed, its close connection with the Maori *patu*. Fig. 20 proves the antiquity of this type and indicates its independence of the hole and curve.

All the principal New Zealand types already described are represented at the Chathams. Some subsidiary features of these types are absent, however, the more notable being: (1) The hole and curve of Fig. 15. (2) The ribbed ornamentation on the *reke* of Figs. 11 and 12. (3) The human figure of Fig. 15. Important subsidiary features which are common to both Maori and Mori-ori groups are: (1) The double-headed *reke* of Fig. 13. (2) Notched ornamentation. (3) The bird-headed *reke*; in the Chathams this was realistic, and not in any degree humanized. (4) A branched ridge on the blade where it joins the handle. This ornamentation occurs on a bone *patu* from Southland in the Fels collection, and on a stone *okewa* in the Otago University Museum. *Okewa* in general show a very close

¹ Pitt-Rivers, *Evolution of Culture*, p. 119.

² *Journ. Anthropol. Inst.*, vol. iii, p. 266.

³ *e. . American Nat.*, 1876, p. 558.

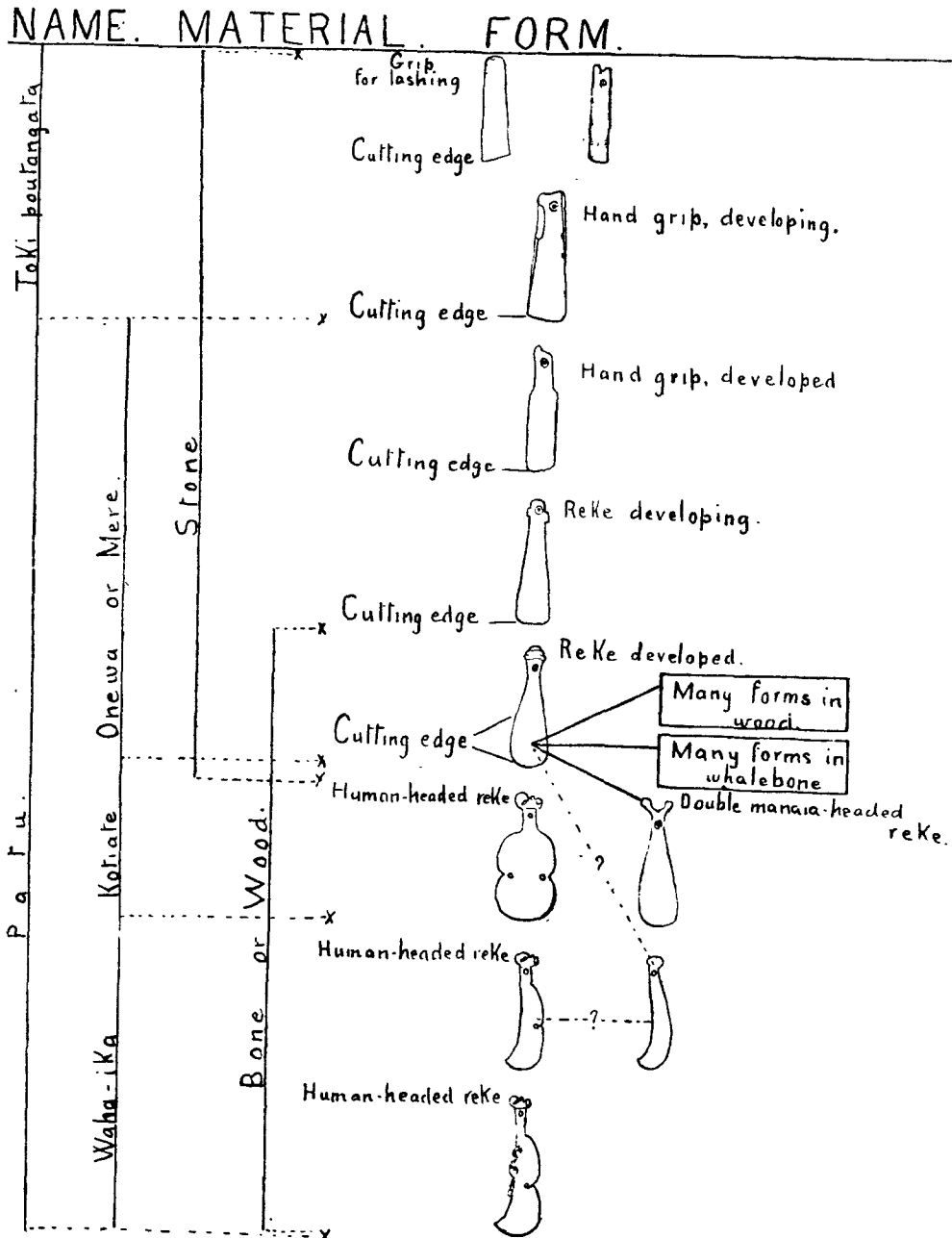


FIG. 18.—GENETIC CONNECTION OF THE FORMS DESCRIBED. THE HEAD CARVED ON THE REKE IS MORE PROPERLY DESCRIBED AS A HUMANIZED BIRD'S HEAD.

relationship to the *patu* of the Otago district, a relationship which is exemplified to an even greater degree by the fish-hooks of these two regions.

Two types of *okewa*, both represented in the Otago University Museum collection, have no parallel in New Zealand, and there are some minor varieties in New Zealand which have no parallel in the Chathams.

If Mori-ori tradition is right in dating the settlement of the Chatham Islands at 28 generations, or 700 years ago, and in stating that there has since been no communication with the outside world, then we must conclude that all the chief varieties of *patu* had evolved in New Zealand before the year A.D. 1200, and that these varieties have persisted since that time in New Zealand and the Chathams,

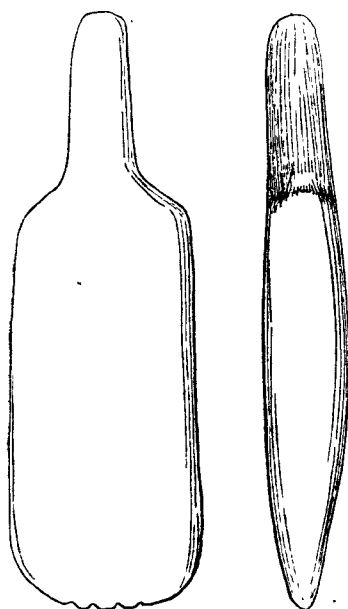


FIG. 19.—OKEWA. OTAGO UNIVERSITY MUSEUM. SCHIST. LOC. CHATHAM ISLANDS.

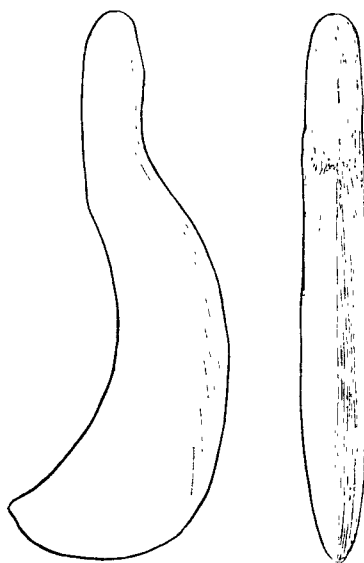
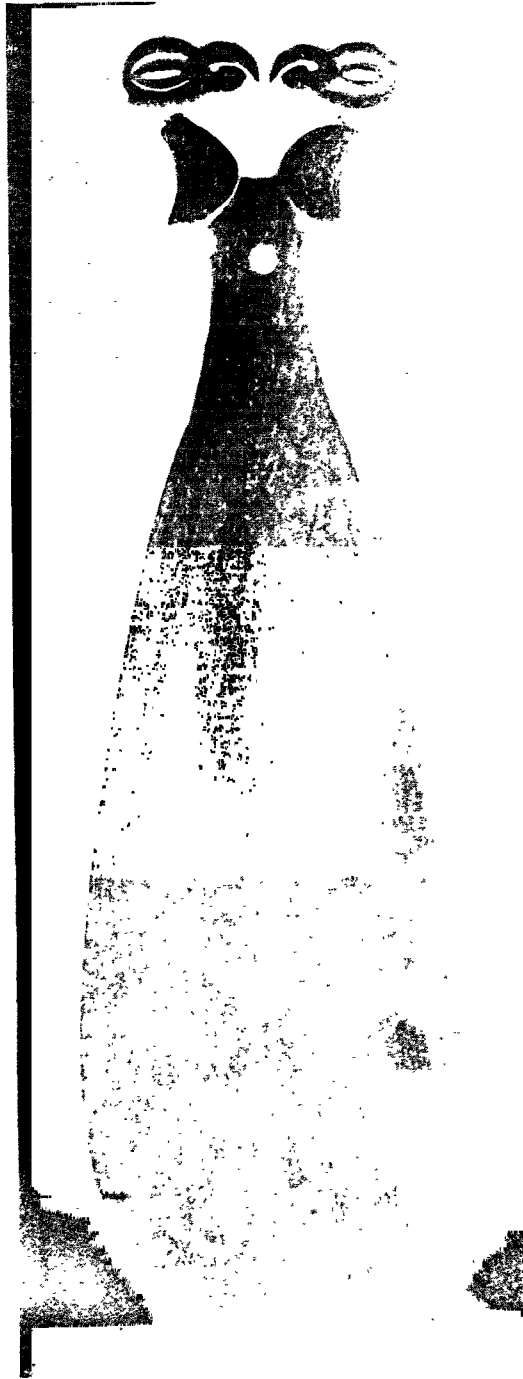


FIG. 20.—OKEWA. OTAGO UNIVERSITY MUSEUM. SCHIST. LOC. CHATHAM ISLANDS.

with only minor changes. The discussion of this and kindred problems must however, be postponed till the end of the war, when the writer hopes to complete a work already begun on the technology and art of the Mori-oris.

Since the above was written Baron A. von Hügel has shown me the magnificent example, Plate X, which is under his care in the Cambridge University Museum of Archaeology and Ethnology. This specimen exhibits as perfect finish as Fig. 12. Its principal interest lies in the two birds above the grip. They indicate clearly the origin of the *manaia* figure in Maori art. In spite of the curved bills they do not necessarily represent parrots. From this piece of evidence we are justified in believing that the *whetu* of Fig. 15, and other figures, is a bird's-head humanized. Unfortunately the locality of this specimen is unknown, though it may be conjectured to be Otago. It is thought to have been brought home by Cook.



MERE PARAOA. CAMBRIDGE UNIVERSITY ARCHÆOLOGICAL
AND ETHNOLOGICAL MUSEUM.
Length $19\frac{1}{2}$ inches. Whalebone. Loc. unknown.

ON THE EVOLUTION OF THE EARLIEST PALÆOLITHS FROM THE ROSTRO-CARINATE IMPLEMENTS.

By J. REID MOIR.

IN the present paper the author proposes to describe and figure a series of ten flint implements derived from—

- (a) The detritus-bed below the Red Crag of Suffolk,
- (b) The stone-bed below the Norwich Crag,
- (c) The Middle Glacial Gravel of Suffolk, and
- (d) River Gravels situated in the Thames Valley and at Warren Hill in Suffolk.

It is proposed also to demonstrate that these ten implements exhibit a gradual evolution from the most primitive form of the rostro-carinate to the more highly developed pointed implement of the earliest Chelles type.

It has generally been supposed that the flint implements of man found in 1909 in the detritus-bed below the Red Crag of Suffolk bear no cultural relationship to the later palæolithic implements. It has also been generally held that these two series of implements—the sub-crag specimens and the palæoliths—were separated by a great gap of time during which vast changes in the configuration of the surface of the land took place. The latter view, involving as it does many complex geological questions, the author, though inclined to look upon it as unsatisfactory, does not feel himself to be competent to discuss with any profit.¹ Regarding the former, he is of the opinion that the series of flint implements which forms the subject matter of this paper, affords evidence tending to show that in the case of the sub-crag rostro-carinates and the pointed implements of the earliest Chelles type there is a distinct cultural relationship. If this evidence is found to be sound, it follows that the whole of the sub-crag “culture” is related to that pertaining to the early Chelles phase. To arrive at a proper understanding of the question presently to be discussed, viz., the relationship of the most primitive rostro-carinates

¹ It appears that M. Commont places the earliest palæolithic implements at about the beginning of the Pleistocene period. (*Les hommes contemporains du Renne*, pp. 5 and 6.)

to the pointed implements of the earliest Chelles type, it appears to be necessary, first of all, to grasp clearly what is implied by the term "rostro-carinate" as applied to a humanly fashioned flint. A rostro-carinate is an implement with broad posterior region, narrowed anteriorly to a quasi-vertical cutting edge. This anterior narrow edge is strongly curved and gives the implement the form of the beak of an accipitrine bird. The form of this region of the implement may also be compared to that of the prow of a boat (the boat being turned keel upwards).

If the implement is held with the prow or beak to the front, there are observed an upper or dorsal plane, a lower or ventral plane, a right lateral and left lateral surface, a posterior surface or stern (P in Fig. 1), and an anterior surface, narrowed to the form of a keel and ending in a beak (hence the term "rostro-carinate") as a consequence of the oblique direction and convergence of the lateral surfaces, which approach one another so as to leave only a narrow keel-like ridge between them.¹

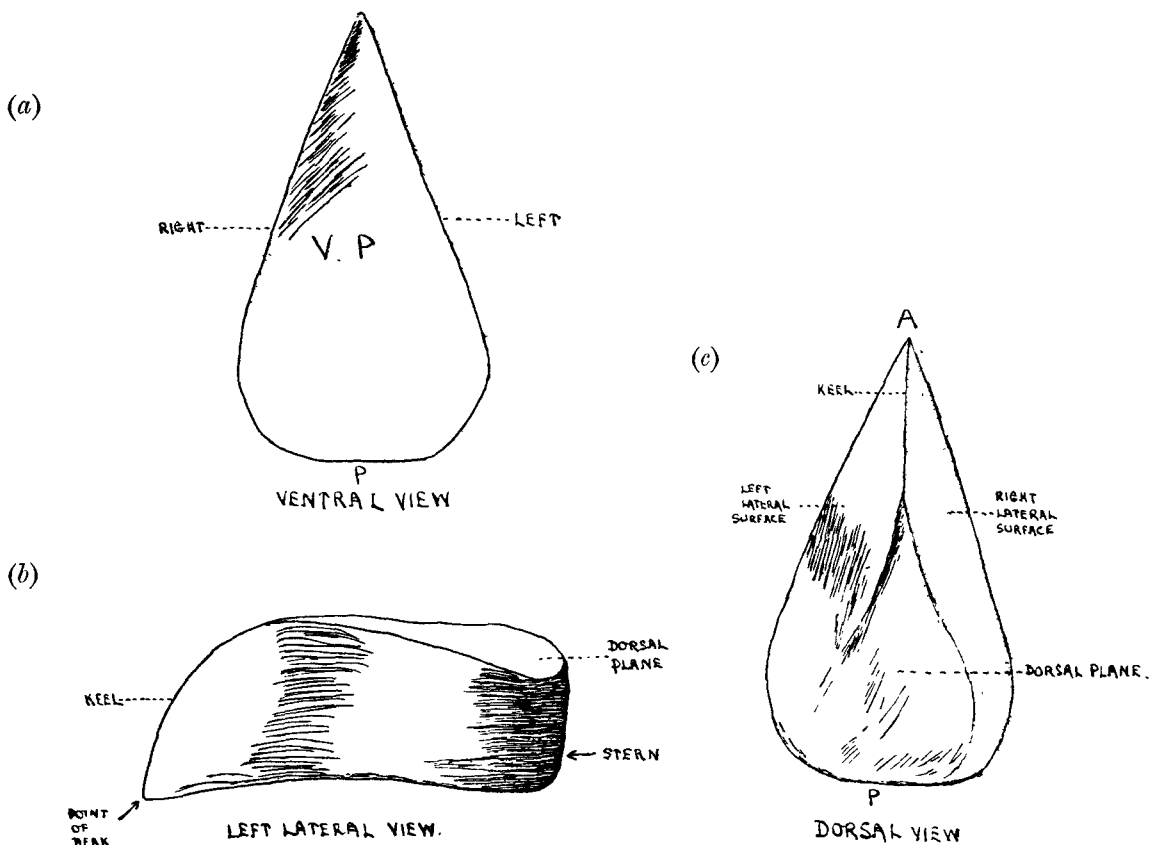


FIG. 1.

¹ This description is copied from that given in Sir Ray Lankester's Memoir (*Phil. Trans., Roy. Soc.*, May, 1912). The drawing of an ideal rostro-carinate which accompanies this description is also taken from the same publication. In all text figures D.P. = dorsal plane. V.P. = ventral plane. Ant. = anterior. Post. = posterior.

The method of making a rostro-carinate flint implement is as follows. A nodule of flint, preferably of a flattened potato shape, is selected and a flake detached from one end in such a manner as to produce the ventral plane (Fig. 2, *a*). Then having by this means produced the necessary flat striking surface, blows are delivered on both sides of this surface and flakes removed to form the typical "keel" (Fig. 2, *b*). It is necessary to hold the flint which is being flaked, in a particular manner, otherwise the flakes will not be removed at the required angle, and no "keel" will be formed.

The overhanging appearance of the anterior narrow edge of the "keel" which gives to it a likeness to the beak of an accipitrine bird, can be produced by removing the primary flake forming the ventral plane of a markedly concave shape (Fig. 2, *c*).

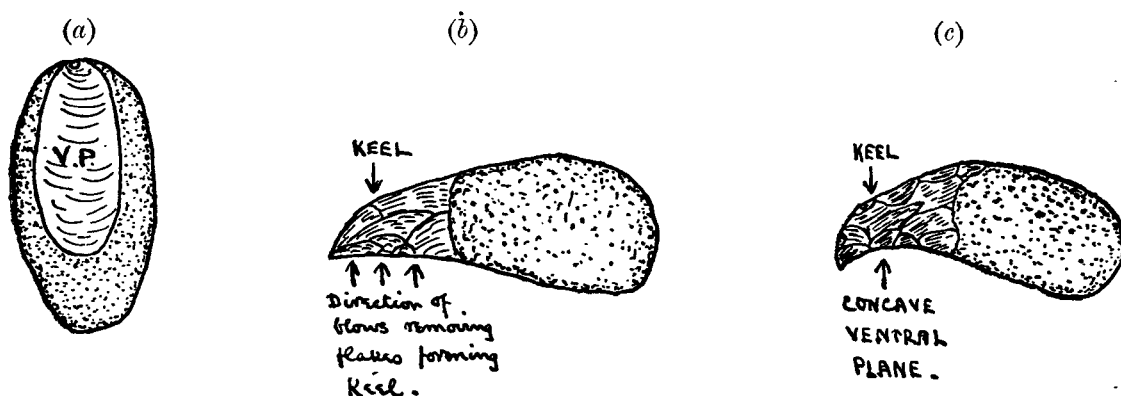


FIG. 2.

It is sometimes found to be necessary to remove flakes by blows delivered upon the dorsal as well as on the ventral surface, in order to produce the desired form of implement, and an examination of the sub-crag specimens shows that their makers occasionally adopted this method.

Having now ascertained the exact form of a rostro-carinate flint implement it is possible to proceed to examine the ten specimens, which it is the main intention of this paper to describe, and to see wherein they approximate to this form or diverge from it. The specimens will be described in an order based upon what the author regards as their state of evolution; the most primitive implement will be dealt with first, and the most highly evolved last.

In this description, no account will be given of the patination, condition, etc., of the various specimens. This inquiry deals solely with their form.

No. 1, Fig. 3.

Recovered from the detritus-bed below shelly Red Crag at Thorington Hall, Wherstead, near Ipswich.

This specimen, which exhibits the various characteristics of a rostro-carinate (as outlined above), is regarded by the author as representing the most simple and

primitive type of this implement yet found below the Red Crag. A flattened nodule of flint, concave on its upper surface, convex upon its lower, with rounded sides, has been flaked at one end into the form of a beak.

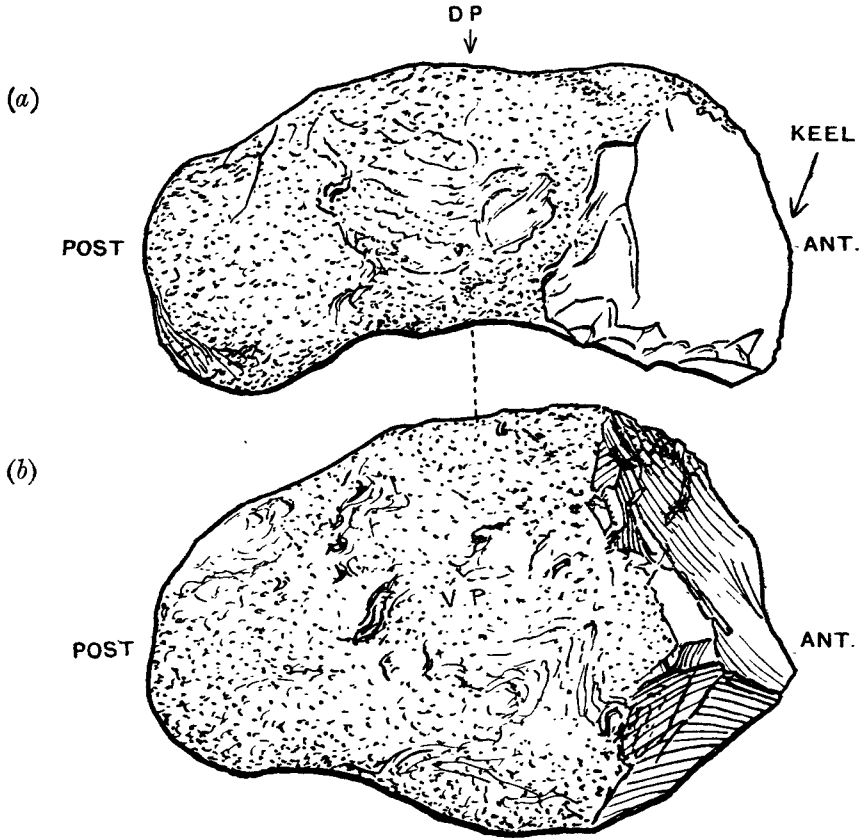


FIG. 3.—VIEW OF (a) RIGHT LATERAL SURFACE ; (b) VENTRAL PLANE OF MOST PRIMITIVE TYPE OF ROSTRO-CARINATE IMPLEMENT. ($\frac{2}{3}$ NATURAL.)

The dorsal and ventral planes, the right and left lateral surfaces and the stern, are all represented by unflaked cortex, which in the case of the ventral plane extends to the very point of the beak. This specimen, then, may be regarded as a true rostro-carinate, but of a very simple and primitive type.

No. 2, Fig. 4.

Recovered from the detritus-bed below the decalcified Red Crag in the brickfield of Messrs. A. Bolton & Co., Ltd., Henley Road, Ipswich. This specimen, which is made from a cylindrical nodule of flint, exhibits the usual characteristics of a rostro-carinate implement. The dorsal plane and the right and left lateral surfaces are represented by unflaked cortex. The stern has had one or two flakes removed, while the opposite end of the nodule has been fashioned into the form of a beak.

The ventral plane in this specimen is largely composed of unflaked cortex, but immediately under the point of the beak a flake has been removed forming a flat surface. This specimen may be regarded as a true rostro-carinate which exhibits an advance on implement No. 1 (Fig. 3), in that the first attempt to produce a ventral plane by flaking is observable.

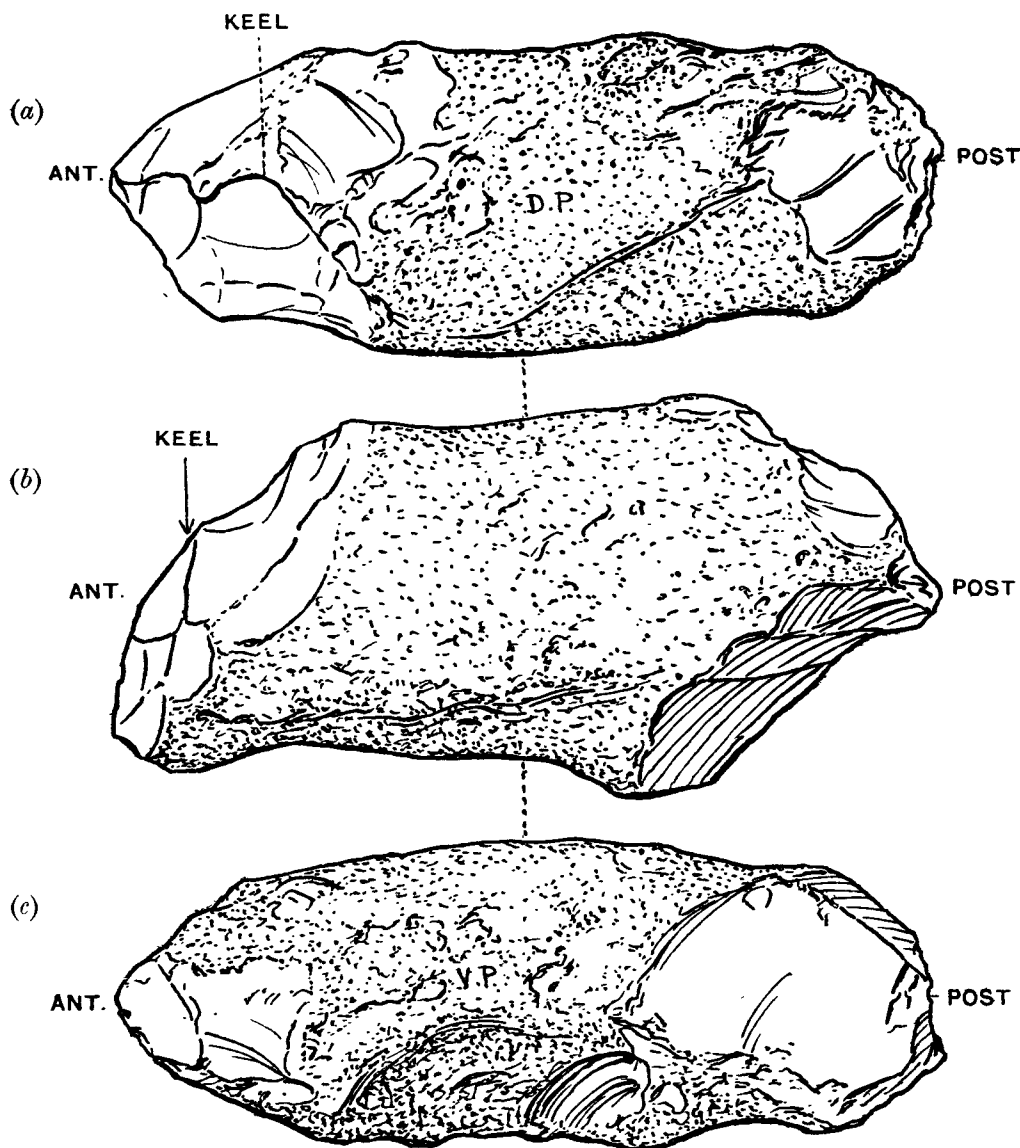


FIG. 4.—VIEW OF (a) DORSAL SURFACE; (b) LEFT LATERAL SURFACE OF ROSTRO-CARINATE IMPLEMENT SHOWING SECOND STAGE OF EVOLUTION; (c) VENTRAL SURFACE. ($\frac{2}{3}$ NATURAL.)

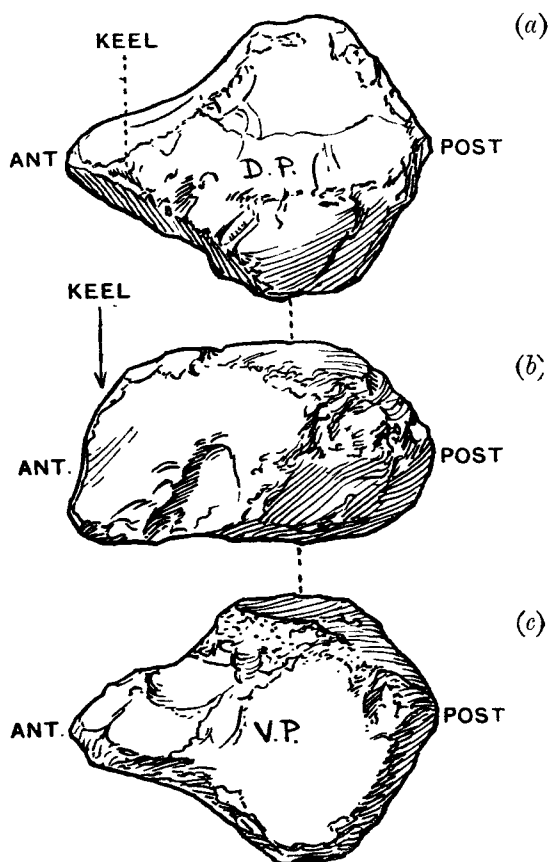


FIG. 5.—VIEW OF (a) DORSAL SURFACE ; (b) LEFT LATERAL SURFACE OF ROSTRO-CARINATE IMPLEMENT SHOWING THIRD STAGE OF EVOLUTION ; (c) VENTRAL SURFACE. ($\frac{2}{3}$ NATURAL.)

No. 3, Fig. 5.

Recovered from the detritus-bed below the decalcified Red Crag in the brickfield of Messrs. A. Bolton & Co., Ltd., Henley Road, Ipswich. This specimen exhibits the usual characteristics of a rostro-carinate implement. The dorsal plane and the stern are composed of unflaked cortex. The right and left lateral surfaces are represented by cortex, while the anterior portion has been flaked into the form of a beak. The ventral surface, in this specimen, exhibits no cortex, but has been formed by flaking. This implement is regarded as a true rostro-carinate exhibiting an advance on specimen 2, in that the whole of the ventral surface has been formed by blows removing flakes.

No. 4, Fig. 6.

Found in a pit at Whitlingham near Norwich, by Mr. W. G. Clarke, in April, 1911. This specimen, which is now housed in the British Museum (Bloomsbury), has been described by E. Ray Lankester (*Description of the Test specimen of the rostro-carinate industry found beneath the Norwich Crag*, Royal Anthropological Institute, Occasional Papers, No. 4).

This specimen, which is entirely "flaked out," that is, has no portion of the original cortex of the flint left upon it, shows all the characteristics of the rostro-carinate type. The ventral surface has been formed by one blow, while the dorsal

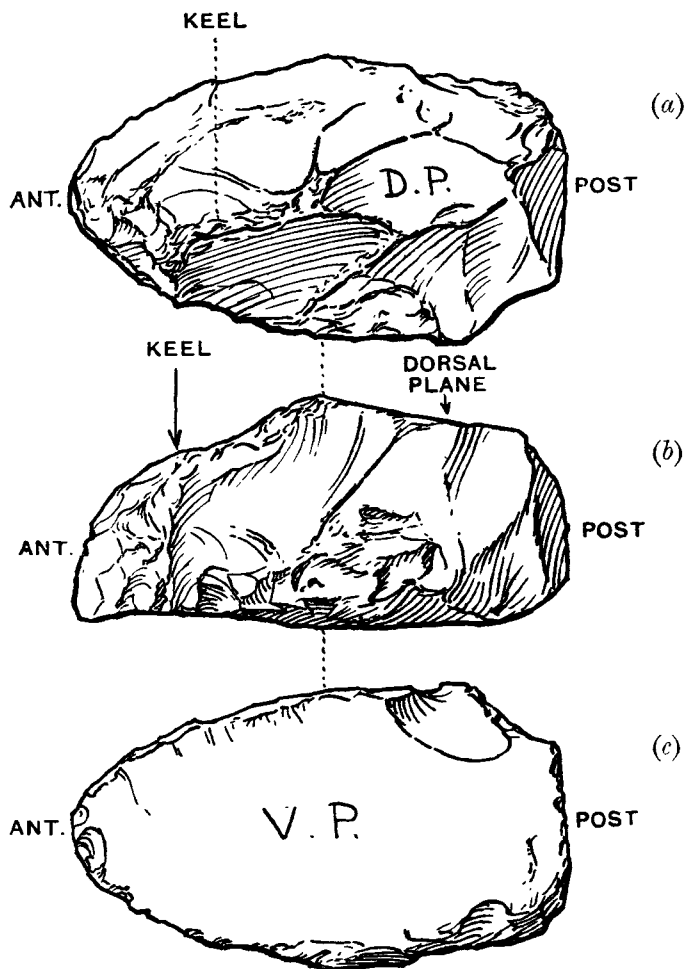


FIG. 6.—VIEW OF (a) DORSAL SURFACE; (b) LEFT LATERAL SURFACE OF ROSTRO-CARINATE IMPLEMENT SHOWING FOURTH STAGE OF EVOLUTION; (c) VENTRAL SURFACE. ($\frac{2}{3}$ NATURAL.)

platform is flat and perfectly developed. This implement shows an advance on specimen 3 (Fig. 5), in that both the dorsal and ventral planes are represented by flaked areas, and by the greater symmetry of its outline.¹

No. 5, Fig. 7.

Recovered from the Middle Glacial Gravel in a pit in the occupation of Messrs. A. Bolton & Co., Ltd., Henley Road, Ipswich. This specimen shows all the

¹ The author is indebted to Sir Hercules Read of the British Museum for permission to figure this specimen.

characteristics of a true rostro-carinate implement, but is more shapely and "delicate" in its outline than the implements hitherto described. It shows a small amount of cortex at the posterior region, but is otherwise entirely "flaked out." It differs

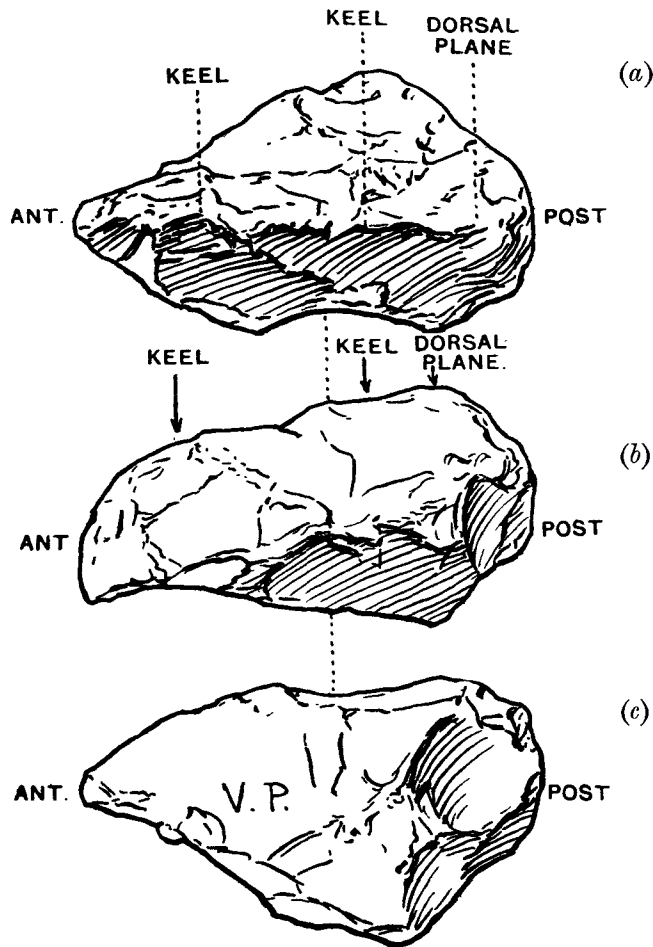


FIG. 7.—VIEW OF (a) DORSAL SURFACE; (b) LEFT LATERAL SURFACE OF ROSTRO-CARINATE IMPLEMENT SHOWING FIFTH STAGE OF EVOLUTION; (c) VENTRAL SURFACE. ($\frac{2}{3}$ NATURAL.)

principally from specimen No. 4 (Fig. 6) in that the keel is extended farther backwards towards the posterior region with a consequent diminution of the size of the dorsal plane, also in the reduction in relative width of the ventral plane.

No. 6, Fig. 8.

Found in 1893, in "Odell's Pit," Dawley, situated near West Drayton in the Thames Valley.¹ The specimen was collected by the late Mr. Allen Brown, and

¹ Specimens 6, 7 and 8 (Figs. 8, 9 and 10) have passed into the author's possession owing to the kindness of Dr. Allen Sturge. The author is greatly indebted to Dr. Sturge for the details supplied to him regarding the finding and provenance of these implements.

was bought with the rest of his collection by Dr. Sturge of Icklingham Hall, Suffolk.

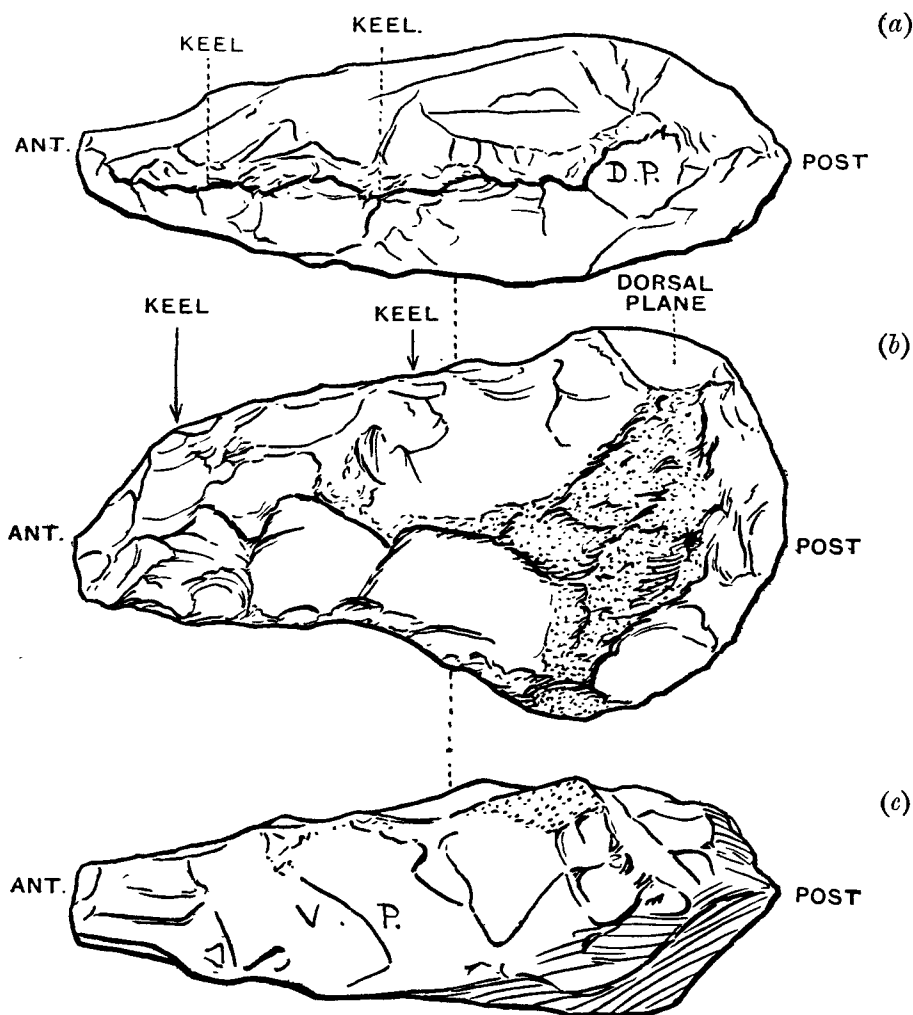


FIG. 8.—VIEW OF (a) DORSAL SURFACE ; (b) LEFT LATERAL SURFACE OF ROSTRO-CARINATE IMPLEMENT SHOWING SIXTH STAGE OF EVOLUTION ; (c) VENTRAL SURFACE. ($\frac{2}{3}$ NATURAL.)

The implement occurred at a depth from the surface of 21 feet, and exhibits all the characteristics of the rostro-carinate type.

The ventral plane is formed by blows, while the keel has been extended backwards towards the posterior region, with a consequent diminution of the size of the dorsal plane. The specimen shows an advance upon implement No. 5 in that it is more elaborately flaked, the keel is more extended in length, and the stern has been flaked into a rough cutting-edge. The relative width of the ventral plane as compared with No. 6 (Fig. 8) is also less.

No. 7, Fig. 9.

Found about fifteen years ago at Warren Hill, Mildenhall, in North-west Suffolk, and acquired by Dr. Sturge from Mr. Worthington G. Smith. The specimen exhibits all the characteristics of a rostro-carinate implement. The

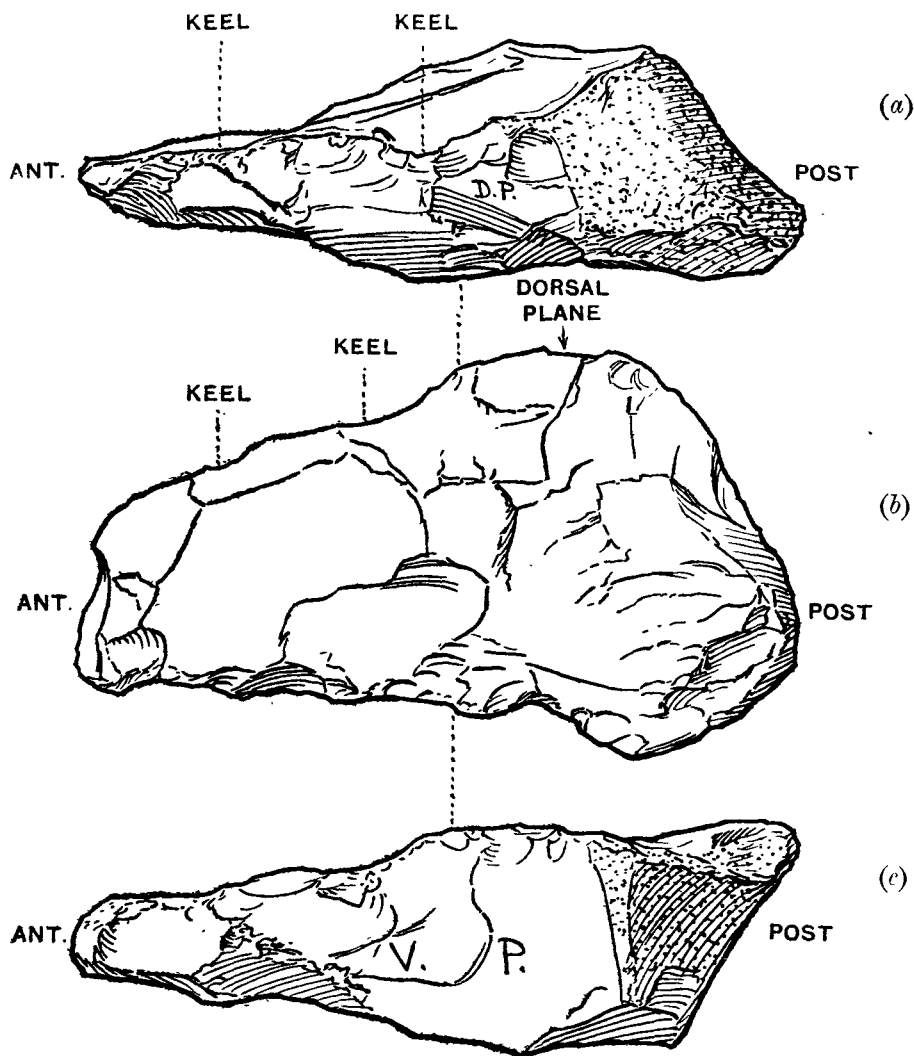


FIG. 9.—VIEW OF (a) DORSAL SURFACE ; (b) LEFT LATERAL SURFACE OF ANOTHER ROSTRO-CARINATE IMPLEMENT SHOWING SIXTH STAGE OF EVOLUTION ; (c) VENTRAL SURFACE. ($\frac{2}{3}$ NATURAL.)

ventral plane has been formed by blows, while the keel has been extended backwards towards the posterior region, with a consequent diminution of the size of the dorsal plane. It is regarded as representing a similar stage of evolution as specimen No. 6 (Fig. 8).

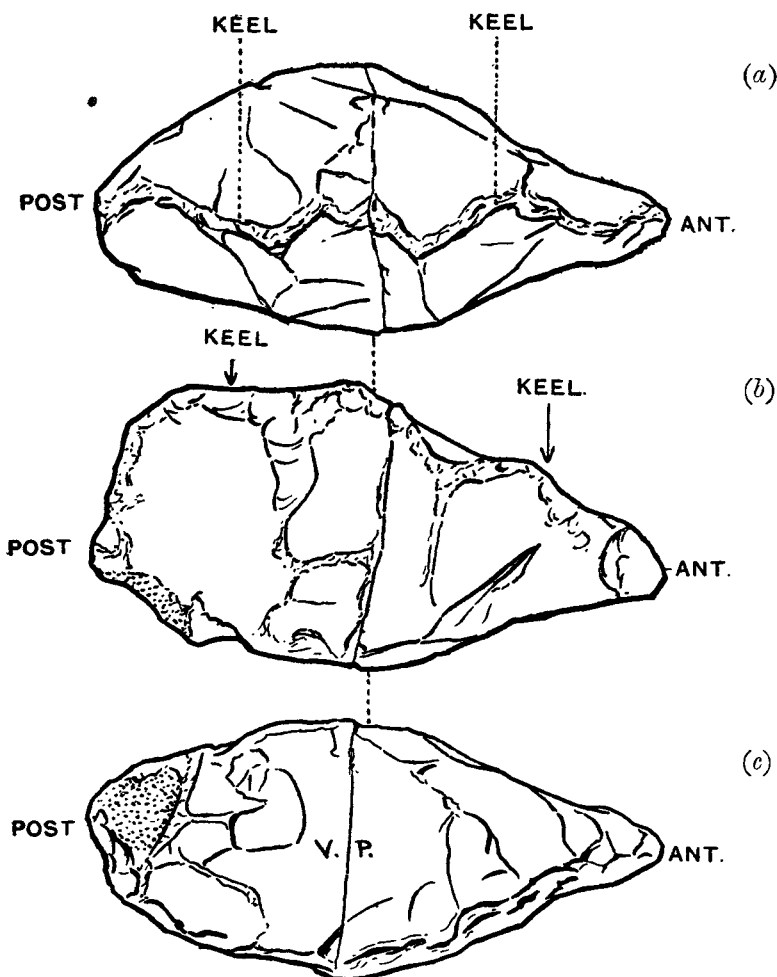


FIG. 10.—VIEW OF (a) DORSAL SURFACE; (b) RIGHT LATERAL SURFACE OF ROSTRO-CARINATE IMPLEMENT SHOWING SEVENTH STAGE OF EVOLUTION; (c) VENTRAL SURFACE. ($\frac{2}{3}$ NATURAL.)

No. 8, Fig. 10.

This specimen came into Dr. Sturge's collection when he purchased the collection of the late Mr. Greenhill. The implement was apparently found at Clapton in the Thames or Lea Valleys, and exhibits all the characteristics of the rostro-carinate type, except that in this case the keel has been extended backwards to the posterior region or stern, with the consequent disappearance of the dorsal plane. The relative width of the ventral plane as compared with Fig. 9 is also less.

No. 9, Fig. 11.

Found in an ancient palæolithic gravel at Ipswich. The specimen, which still retains the outline of the rostro-carinate form with the usual thickening of the

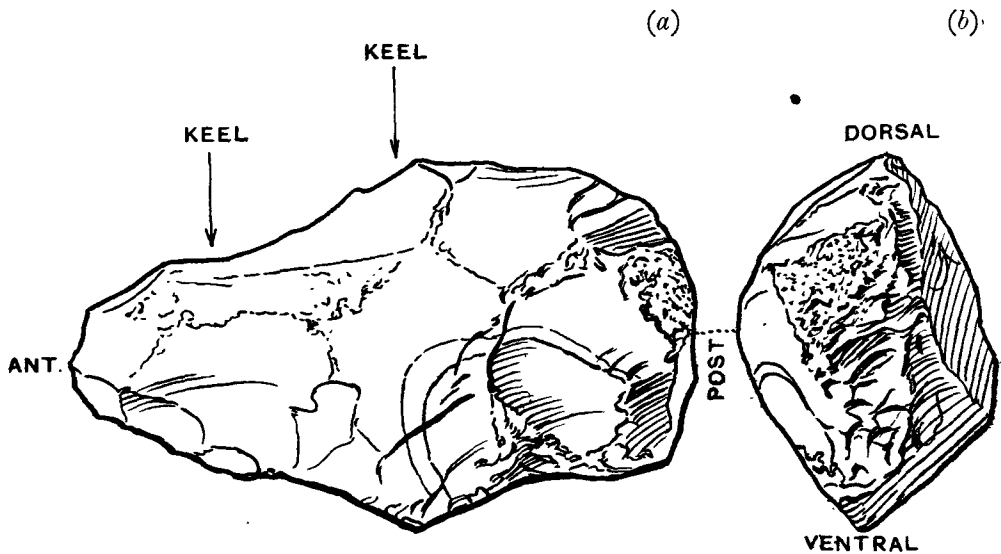


FIG. 11.—VIEW OF (a) LEFT LATERAL SURFACE AND (b) STERN (RHOMBOIDAL IN SECTION) OF EARLY CHELLES PALÆOLITHIC IMPLEMENT, SHOWING FORM EVOLVED FROM ROSTRO-CARINATE. ($\frac{2}{3}$ NATURAL.)

posterior region, approximates to the last-described specimen in that the keel is extended backwards to the posterior region or stern. The ventral plane, however, has been still more reduced in width and now forms a rough cutting-edge.

No. 10, Fig. 12.

Found in a gravel pit at Furze Platt, near Maidenhead in the Thames valley.¹ The specimen, which still retains the outline of the rostro-carinate form, with the usual thickening of the posterior region (which in this case is formed almost entirely of cortex), approximates to the last-described implement, in that the keel is extended well backwards to the posterior region.

The anterior portion of the ventral plane is so reduced in thickness as to form a cutting edge, while the posterior portion is formed of unflaked cortex. This specimen shows an advance upon Fig. 11, in that the anterior region is much thinner, and the keel and ventral cutting-edge in consequence more acute.

The foregoing examination of these ten specimens has shown that the following fundamental changes have occurred in the making of a rostro-carinate implement :—

- (1) The substitution of a ventral plane, formed partly by blows removing flakes, for the ventral plane composed entirely of cortex such as is exhibited by the most primitive rostro-carinate specimens.
- (2) The gradual elimination by flaking of cortex from the ventral plane, and the production of a flat dorsal plane formed by blows removing flakes and devoid of cortex.

¹ The author is indebted to Mr. E. T. Lingwood, of Westleton, Suffolk, for permission to describe and figure this specimen.

- (3) The gradual reduction in width of the ventral plane by flaking, until a cutting-edge is produced, and the prolongation of the ventral plane and the keel to the posterior region, accompanied by a great reduction in size, and in many cases the disappearance of the dorsal plane.

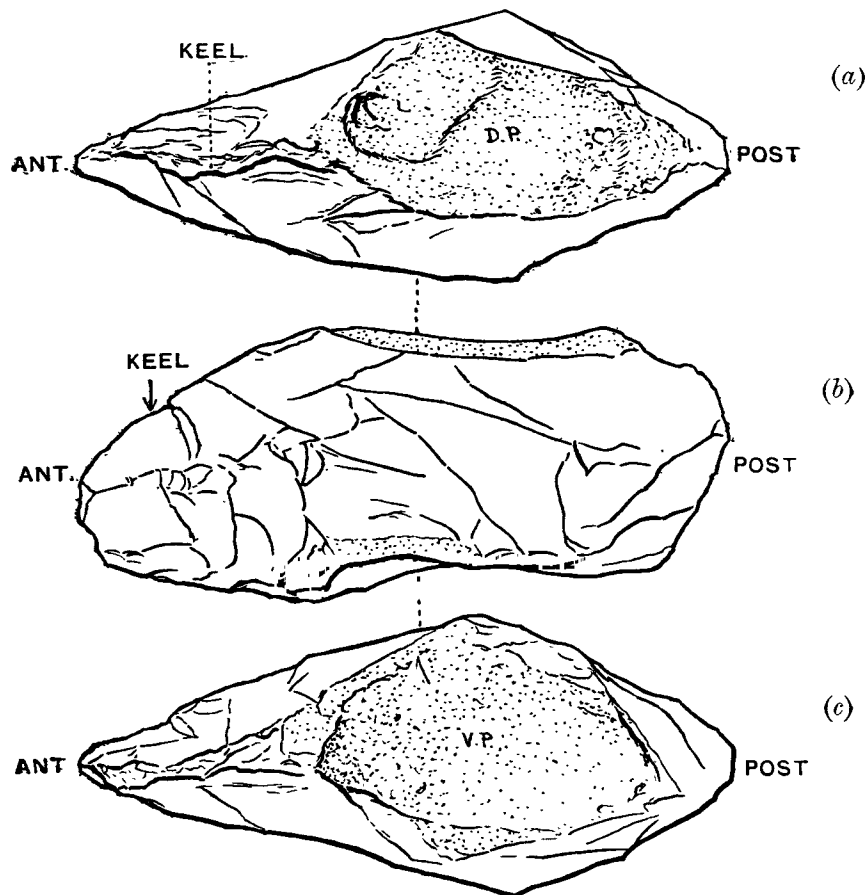


FIG. 12.—VIEW OF (a) DORSAL SURFACE ; (b) LEFT LATERAL SURFACE OF PALÆOLITHIC IMPLEMENT OF CHELLES TYPE SHOWING ADVANCE ON PREVIOUS FIGURE ; (c) VENTRAL SURFACE, ($\frac{2}{3}$ NATURAL.)

The examination has shown also, in the author's opinion, that the earliest Chelles palæoliths of the pointed type were evolved from the rostro-carinate implements, and he now proposes to show by means of various diagrams and drawings, together with an account of some experiments in flint flaking, how, in all probability, this evolution was brought about. The section of a rostro-carinate implement is roughly a triangle and Figs. 3 to 10 exhibit such a section.

The base of the triangle is represented by the ventral plane, while the apex is represented by the keel. The ventral plane afforded the necessary flat striking surface for the removal of flakes in the formation of the keel. As this ventral plane was gradually extended backwards from the anterior to the posterior

region, so the flat striking surface was extended, and the prolongation of the keel backwards to the posterior region (with the consequent disappearance of the dorsal plane) made possible. The section of the earliest (Chelles) palæoliths of the pointed type is roughly rhomboidal, and Fig. 11, which is of this type, shows this section.

Fig. 13 shows how the change from the triangular form of the rostro-carinate to the rhomboidal form of the earliest Chelles palæoliths of the pointed type was brought about. The two areas indicated by crosses and dotted lines were removed by flaking (principally but not entirely by blows delivered on the flat ventral surface), and the rhomboidal form of implement produced.

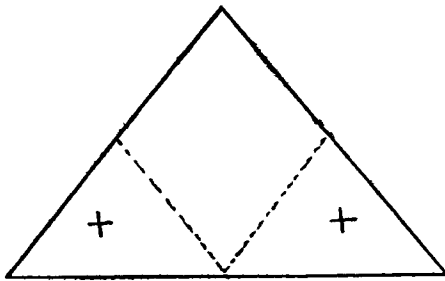


FIG. 13.

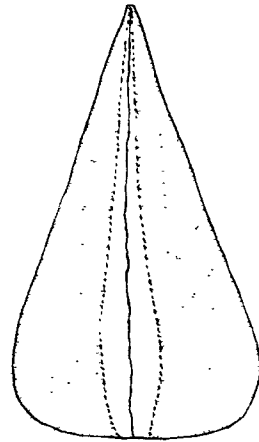


FIG. 13A.—SHOWING EDGE VIEW OF PALÆOLITHIC IMPLEMENT (IN DIAGRAM) AS LEFT WHEN THE SHADED AREAS ARE FLAKED AWAY.

The author has conducted numerous experiments in flaking, and finds that the method described above is easily followed. The flint was first flaked into the form of a rostro-carinate, and then flakes were removed by means of blows delivered principally on the flat ventral plane, so as to transform this ventral plane into a rough cutting-edge, and in so doing to make an implement rhomboidal in section and approximating to the earliest Chelles palæoliths of the pointed type.¹ (Fig. 13A.)

The serious attention of the reader is invited to Figs. 8, 9 and 10, which have been described.

These implements were each found many years ago in palæolithic gravel beds in the Thames Valley and at Warren Hill in Suffolk, by collectors well known in scientific circles. In the days when these specimens were found rostro-carinates

¹ The transformation of the flat ventral plane into a cutting-edge necessarily brought about a change in the manner of holding the implement. The earliest Chelles specimens were no doubt grasped by the posterior region. When this posterior region, in its turn, was developed into a cutting-edge, then prehension was almost certainly given up and the implements mounted in some manner.

were unknown, and the flints were collected as representing early palæolithic implements, and undoubted works of man. The author concludes that there is no prehistorian in any way familiar with flint implements, who would dispute the "humanity" of these particular specimens, as such non-acceptance would carry with it the rejection of all the most ancient palæolithic implements. It has been seen by the description furnished above, that without doubt these specimens (Figs. 8, 9 and 10) are of the rostro-carinate type, and it seems that all prehistorians will now agree to recognize the rostro-carinate as a distinct type of humanly-fashioned flint implement.

These particular forms of implement, as represented by Figs. 8, 9 and 10 of the foregoing list, have been known to prehistorians as "side-choppers," and this designation seems correct.

In each case the flat ventral plane affords a suitable flat surface for grasping, and the opposing keel a cutting-edge. The keel of Fig. 8 shows extensive evidence of its use as a side-chopper. The realization of the use to which these rostro-carinates of the Early Palæolithic Period were put, also gives an indication of the manner in which the still earlier representatives of this type of implement were used. In the case of these latter specimens also there seems little reason to doubt that the keel also afforded a cutting-edge, and the ventral plane the necessary flat surface for prehension.¹

It is somewhat difficult to name a use for the flat dorsal plane exhibited in Fig. 6, but this may have been used for rubbing, in the "preparation" of skins. With a view to ascertaining if further specimens of the Early Palæolithic "side choppers" existed (other than those described in this paper), the author has examined the collections in the British Museum (Bloomsbury) and the Museum at Ipswich, and finds that both these institutions possess such implements.

Those in the British Museum include—

2 from Shrub Hill; 1 from Aylsford; 3 from Swanscombe; 1 from Brandon; 1 from Kempston, Beds; 2 from Hill Head, Southampton; and 1 from Kent's Cavern (8-ft. level).²

Ipswich Museum—

1 each from Warren Hill, Lakenheath, Mildenhall, and Canterbury.

Dr. Sturge has also very kindly examined his large collection and states that he has "side-choppers" from West Drayton, Southall, Hanwell, Hayes, Dawley, Acton, Clapton, Hackney, Stoke Newington, Leytonstone, Wanstead, Swanscombe, and Galley Hill, in the Thames Valley. The Grindle Pit, Bury St. Edmunds;

¹ It may be mentioned that many of the rostro-carinates from below the Red Crag, etc., exhibit signs of having been so used.

² From drawings and photographs kindly supplied to the author by Major Marriott, D.S.O., there seems little doubt but that several of the oldest implements from Kent's Cavern approximate to the rostro-carinate type.

Sicklesmere, near Bury St. Edmunds; Weatherhill Pit, Icklingham; Warren Hill; High Lodge Hill Gravel; Snare Hill, Thetford. Santon Downham, Lakenheath, Brandon Fields, Shrub Hill and Methwold Warren—localities all situated in North-west Suffolk and South-west Norfolk. Other English Gravels at Kempston, Beds; Broom Pit, Axminster; and Farnham, Surrey.

Dr. Sturge remarks that these "side-choppers" seem rarer in France than in England, as in over 100 specimens in his collection from St. Acheul there is only one, and that not quite typical. They appear to occur among the plateau specimens from Dordogne.

Examples also occur in his series from Somaliland, from the desert west of Thebes, and one specimen from "behind Table Mountain," South Africa. Dr. Sturge, to whom the author is much indebted for this very valuable information, believes that in his large series of implements from Madras these "side-choppers" occur. The author must also record a heavy palæolithic chopper in his own collection from Béthune, France, which distinctly shows the rostro-carinate form (Fig. 14).

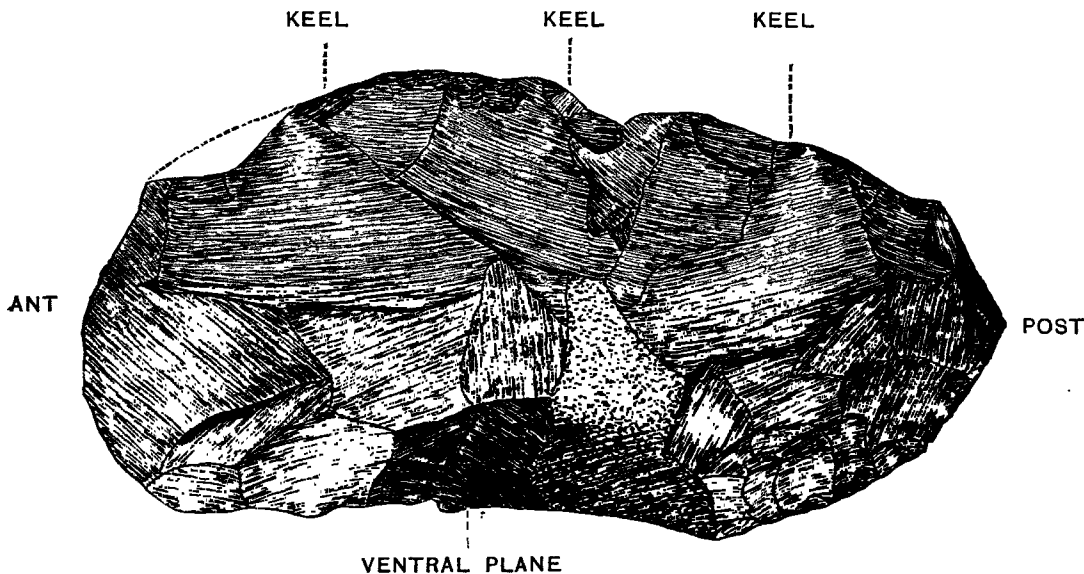


FIG. 14. ($\frac{2}{3}$ NATURAL.)

All the specimens examined by the author in the British Museum and the Museum at Ipswich are referable to the earliest Palæolithic Period, and Dr. Sturge writes, "As to period, they seem to be of all the gravel periods from what I believe they call pre-Chelléen, through the so-called Chelléen and onwards. I seem to have no true side-chopper from Elvedon, which is a very late 'drift' period." As these "side-choppers," which the author regards as highly evolved rostro-carinate implements, are so comparatively numerous, there seems little reason to doubt that further examples will now be recognized in other collections in different parts of the country.

It appears that the late Sir John Evans recognized the peculiar form of some of the earlier palaeolithic implements of the pointed type, as on p. 554 of his *Ancient Stone Implements of Great Britain*, Second Edition, he figures what is without doubt a rostro-carinate implement.

The drawing which appears on the left-hand side of this page of his book clearly shows the remains of the ventral plane towards the anterior region of the implement (the ventral plane is evidently in process of being transformed into a cutting-edge in the manner which has been described earlier in this paper). The drawing on the right-hand side of the page shows the keel extending from the anterior region back to the dorsal plane, which in this case is formed of unflaked cortex.

The section of the implement is triangular, which, as has been shown, the rostro-carinate specimens exhibit. Sir John Evans describes this specimen as follows: "The finely wrought specimens are rarer at Red Hill than at Santon Downham; but here, as elsewhere in this district, implements are occasionally found of what has been aptly termed the Shoe-shaped type,¹ of which an example is shown in Fig. 429. *The form is flat on one face, the other being brought to a central ridge rising towards the butt*, which is usually rounded and obtusely truncated. In this specimen the greater part of the butt-end, or heel, of the shoe exhibits the original crust of the nodule of flint from which the implement was formed. *The point, which is usually brought to a semi-circular edge*, has been broken in old times either by use or by attrition in the gravel. Most of these shoe-shaped instruments have been formed from large spalls of flint, *so that the flat face has been the result of a single blow*, though occasionally retouched by subsequent chipping." (The italics are the present author's.)

The excellent drawings published by Sir John Evans and the lucid description of this Red Hill implement show, beyond any question, that it is of the rostro-carinate form.

The "one flat face" formed by "a single blow," "occasionally retouched by subsequent chipping," refers to the flat ventral plane which in some cases is being transformed into a cutting-edge by "subsequent chipping." The other face of the implement, which is "brought to a central ridge rising towards the butt," is an excellent description of the "keel" of a rostro-carinate, while the statement that "the point is usually brought to a semi-circular edge" indicates the curvature of the keel downwards to the anterior region or point of the beak of this type of implement. As has been mentioned by Sir Ray Lankester (*Phil. Trans., Roy. Soc.*, May, 1912) Sir John Evans figures on p. 567 of his famous work (Fig. 444) a typical rostro-carinate implement found in North-west Suffolk, which he regarded as having been "designedly chipped" to fulfil some special purpose.² The author

¹ The flat sole of the "shoe" represents the flat ventral plane and the curving outline of the "toe" the keel of the rostro-carinate implement.

² It is clear that Sir John Evans shared the author's view as to the use to which the rostro-carinate implements were put, as he states regarding the specimen figured that it has "an oblique hatchet-like edge at the end." (*Ancient Stone Implements*, p. 568.)

has in his own collection a palæolithic implement from the famous gravel-pit at Dovercourt, Essex, which is of the true rostro-carinate type, and which, like Fig. 429 in Sir John Evans's book, shows the ventral plane partly transformed into a cutting-edge. In the Dovercourt specimen, however, it is the portion of the ventral plane towards the anterior region of the implement which has been so transformed, while the portion towards the posterior region remains intact (Fig. 15).

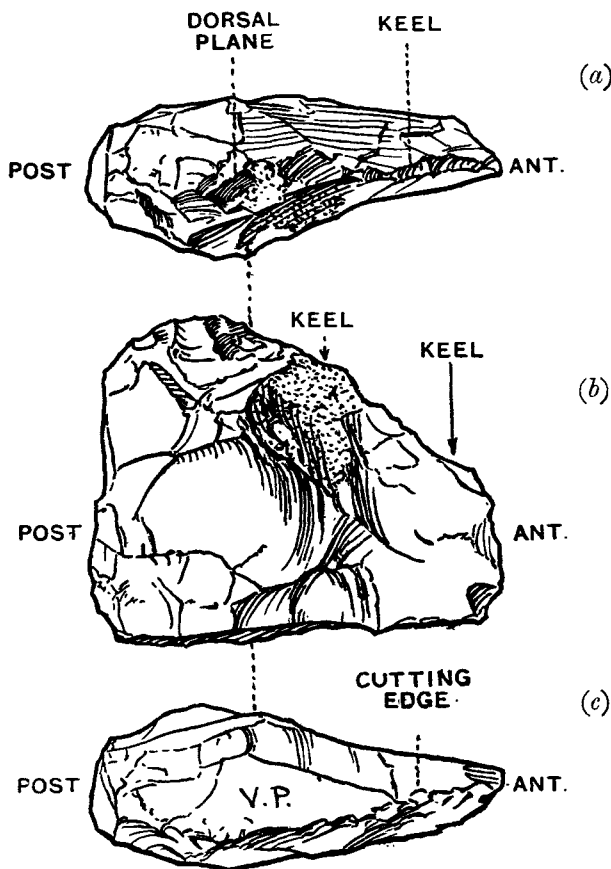


FIG. 15.—VIEW OF (a) DORSAL SURFACE: (b) RIGHT LATERAL SURFACE OF ROSTRO-CARINATE IMPLEMENT OF PALÆOLITHIC AGE FROM RIVER-TERRACE GRAVEL, DOVERCOURT, ESSEX; (c) VENTRAL SURFACE. ($\frac{2}{3}$ NATURAL.)

If the author is right in his view as to the evolution of the earliest Chelles palæoliths of the pointed type from the rostro-carinate implements, then these latter specimens were also the parents of the St. Acheul palæoliths, which were admittedly evolved from the rougher Chelles type. The author considers that many of these St. Acheul specimens show, by means of what is known as the "lateral platform" which they exhibit, that they are related to the rostro-carinate implements. This "lateral platform" is a flat area evidently produced in the original "roughing out" of the implement, which occurs, almost invariably, at the

end of one or other of the lateral edges, and nearest to the "butt-end" or posterior region of the implement. When an example of the pointed St. Acheul implement, showing a lateral platform so situated, is regarded, not in the usual manner, with the point of the specimen upwards, but with the lateral platform uppermost and the point of the implement to the left (Fig. 16), it is seen that this platform occu-

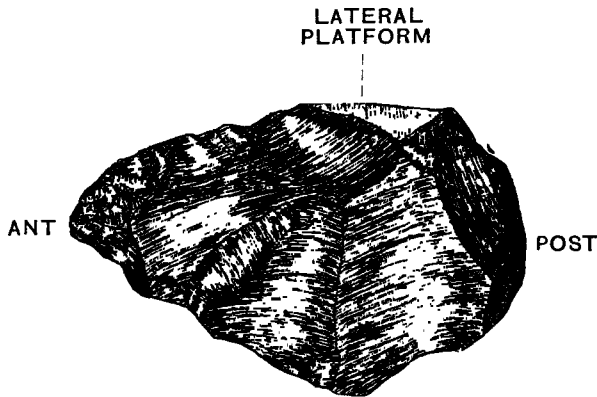


FIG. 16.—VIEW OF PALÆOLITHIC IMPLEMENT FROM THAMES GRAVEL, SHOWING LATERAL PLATFORM. ($\frac{2}{3}$ NATURAL.)

pies the same position as the dorsal plane of a rostro-carinate implement. It is noticeable also that many of the St. Acheul specimens of the pointed type, when regarded in the manner indicated above, show a remarkable resemblance in their profile to the profile of the rostro-carinate implements (Figs. 17 and 18).

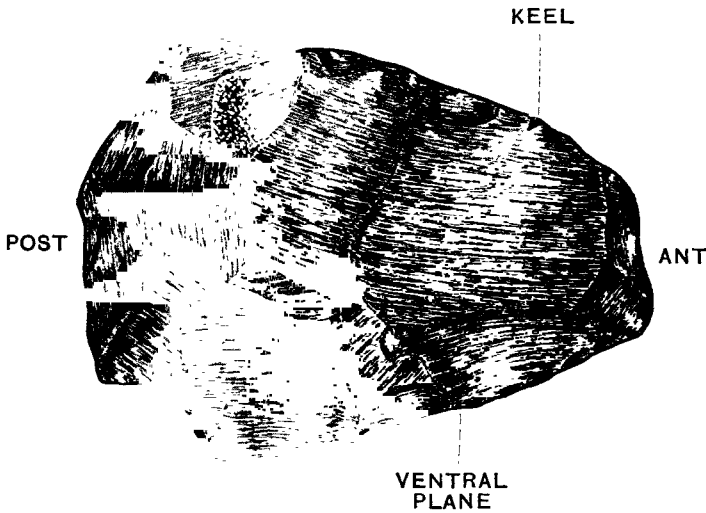


FIG. 17. ($\frac{2}{3}$ NATURAL.)

This resemblance is to be seen in the fact that one of the lateral edges of the implement curves downwards in a strongly marked manner towards the point or anterior region of the implement, while the other lateral edge forms a more or less

straight line from the posterior to the anterior region.¹ In the author's opinion this downward curvature of one lateral edge and the straightness of the other, as seen in so many pointed palæolithic implements of the St. Acheul type, indicate the relationship of these specimens to the rostro-carinate type.

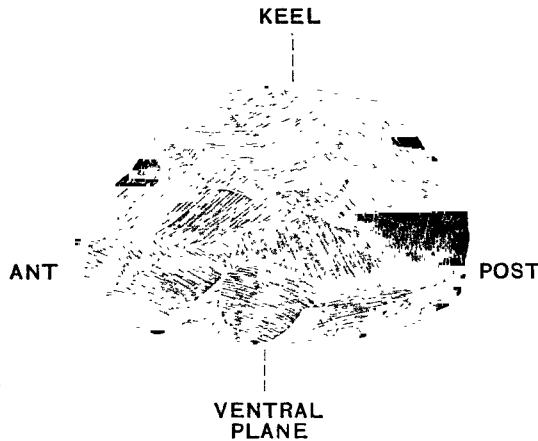


FIG. 18. ($\frac{1}{3}$ NATURAL.)

The downward curvature of one of the lateral edges represents the keel of the rostro-carinate, which, as has been shown, also curves downward to the anterior region of the implement, while the straightness of the other lateral edge represents the straight ventral plane of the rostro-carinate form.

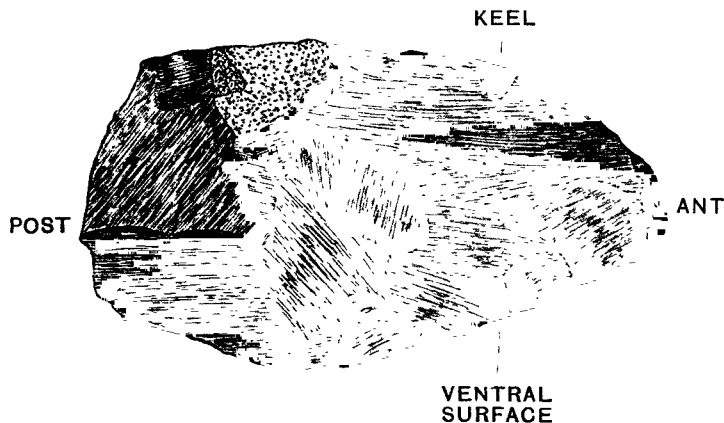


FIG. 18A. ($\frac{2}{3}$ NATURAL.)

(Flaked by the Author.)

¹ It is suggested that in future such palæolithic implements should be regarded and figured in this aspect, so that their true significance may be recognized: the thickened "butt" end of the implement (hitherto regarded as the base) representing the posterior region and the point the anterior; the upper curved lateral edge representing the keel and the straight lateral edge the ventral region or true base of the implement.

This same difference in the outline of the edges appears in the implements which can be produced by first of all flaking the flint into the rostro-carinate form (Fig. 18A). The reader is referred to Figs. 415, 419, 422, 429, 436, 440, 442, 447, 448, 449, 453, 457, 459, 465 and 475 of Evans's *Ancient Stone Implements of Great Britain*, Second Edition, for examples of the type of implement described.¹

In the Museum at Ipswich there are fifteen specimens of palæolithic implements showing this peculiar asymmetry of the edges, and the author has nine in his own collection. Similar specimens probably occur in every collection of palæolithic implements, and the peculiar form of these flaked flints seems intimately related to the plan upon which the ancient flaker made his implement. The author is of the opinion that this plan consisted, first of all, in producing a rostro-carinate, and then proceeding to form a pointed palæolithic implement from it.

The author has conducted various experiments in flaking flints, and finds that the easiest way to make a palæolithic implement of the pointed type is to proceed on the rostro-carinate plan. The specimen under manufacture passes through various stages, and finally emerges as a pointed implement.

In this process the dorsal plane becomes more and more reduced in size, and finally appears as a lateral platform. A specimen flaked by the author is shown (Fig. 19), exhibiting a lateral platform, which is the remains of the dorsal plane of

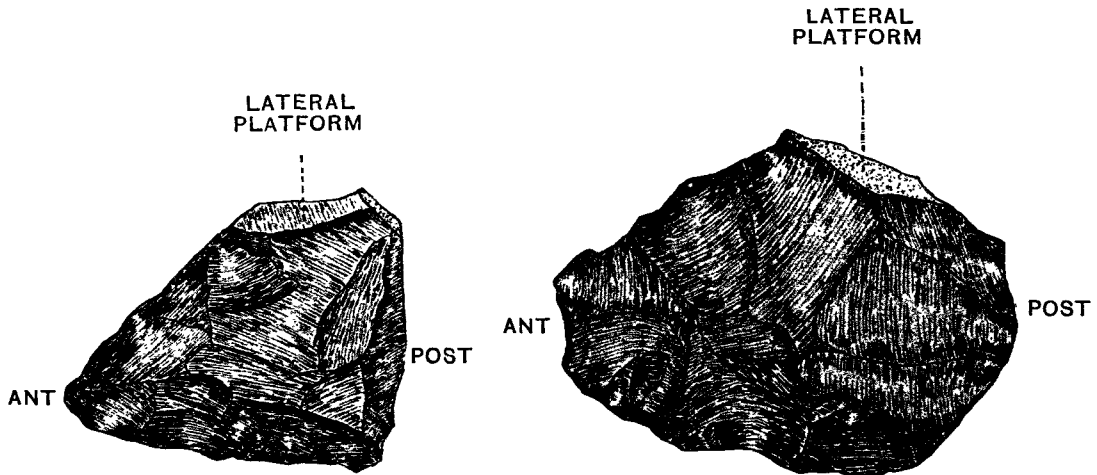


FIG. 19. ($\frac{2}{3}$ NATURAL.)

FIG. 20. ($\frac{2}{3}$ NATURAL.)

¹ It is of interest to note that Sir John Evans also recognized this peculiar asymmetry of the edges of palæolithic implements. On p. 559 of his work *Ancient Stone Implements* he refers to this peculiarity and states that it gives the implements a tendency to assume a "crescent-like" form: the chord of the crescent being the ventral plane and the arc the curving keel of the rostro-carinate form.

the rostro-carinate stage, and for comparison an implement from Galley Hill, Kent, which also shows a lateral platform¹ (Fig. 20).

This lateral platform occurs occasionally upon implements of the ovate type. If, as seems probable, the ovates were evolved from the pointed implements by the simple method of substituting the pointed end for a rounded cutting-edge, the occurrence of a lateral platform upon such specimens is easily explained (Fig. 21).

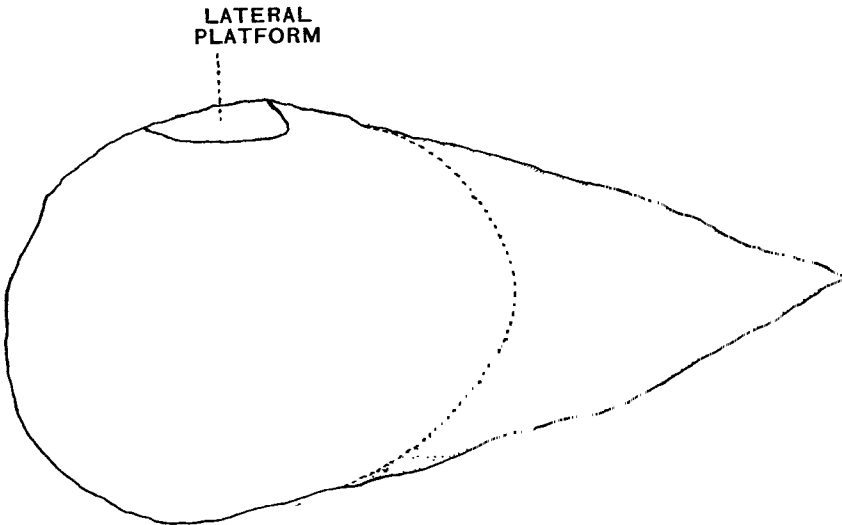


FIG. 21.—DIAGRAM SHOWING HOW OVATE IMPLEMENT MAY BE EVOLVED FROM THE POINTED TYPE BY REMOVAL OF SHADED PORTION BY FLAKING. THE LATERAL PLATFORM IS RETAINED.

The author wishes to express his gratitude to Mr. Reginald Smith for his courtesy in giving him facilities for examining a number of specimens of flint implements in the British Museum (Bloomsbury), and to Mr. Lambert for the excellent drawings which accompany this paper. Figs. 1, 2, 13, 13A, 14 to 21 were drawn by the author.

The author is also indebted to Major Marriott, D.S.O., of Lewes, for particulars regarding some of the oldest implements found in Kent's Cavern Torquay.

¹ It is possible that some of these lateral platforms may be the remains of the *ventral* surface of the rostro-carinate form, but this can generally be determined by examining the implement in profile.

SUMMARY.

A series of ten flint implements recovered from—

- (a) The detritus-bed below the Red Crag of Suffolk,
- (b) The stone-bed below the Norwich-Crag,
- (c) The Middle Glacial Gravel of Suffolk, and

(d) River Gravels situated in the Thames Valley and at Warren Hill in Suffolk, are described, and it is shown that the most primitive type of rostro-carinate implements from below the Red Crag of Suffolk has been evolved by gradual stages into the earliest Chelles palæoliths of the pointed type. These stages are as follows:—

- (1) The substitution of a ventral plane formed partly by blows removing flakes for the ventral plane composed entirely of cortex, such as is exhibited by the most primitive rostro-carinate implement.
- (2) The gradual total elimination by flaking, of cortex from the ventral plane, and the production of a flat dorsal plane by blows removing flakes and devoid of cortex.
- (3) The gradual reduction in width of the ventral plane by flaking until a cutting-edge is produced, and the prolongation of the keel to the posterior region, accompanied by a great reduction in size, and, in many cases, the disappearance of the dorsal platform.

Three of the flint implements described were found many years ago, before rostro-carinates were known, in the Thames Valley and at Warren Hill in Suffolk. These specimens were collected as palæolithic “side-choppers,” but it is evident they are rostro-carinate implements. Numerous other specimens of such palæolithic “side-choppers” from various parts of the world are mentioned. As there can be no doubt as to the “humanity” of these palæolithic specimens, it should now be admitted by all prehistorians that the rostro-carinate is a definite type of humanly-fashioned flint. It is pointed out that if the earliest Chelles palæoliths of the pointed type are related to the rostro-carinate implement, then the later St. Acheul implements which were admittedly evolved from the Chelles specimen, must also be related to the rostro-carinates. This relationship is, in the opinion of the author, shown in the presence of a “lateral platform” on so many of the St. Acheul implements. This lateral platform is in all probability the remains of the dorsal plane of the rostro-carinate.

Many of the St. Acheul implements, in their profile, also show their relationship to the rostro-carinate implements.

The author has conducted various experiments in flaking flints, and finds that the easiest way to make an implement of the pointed type is to proceed as if it were desired to make one of the rostro-carinate form. He has found that the

remains of the dorsal plane appear as a lateral platform on the specimens he has made, and that the outline of the rostro-carinate is sometimes preserved. Lateral platforms appear on ovate implements, but as these were in all probability evolved from specimens of the pointed type, by the simple method of substituting a rounded cutting-edge for the pointed end, the occurrence of such lateral platforms upon these specimens is easily explained.

SOME VOTIVE OFFERINGS TO THE VENETIC GODDESS REHTIA.

[WITH PLATE XI.]

By R. S. CONWAY, Litt.D. (*Manchester University*).

VOTIVE offerings of an unusual type, to which indeed no near parallels have yet been adduced, have come to light in the north-eastern district of Italy in the course of the excavations of the last thirty years. They belong to the people whom the Romans called *Veneti*, of whose language we have a valuable record in the inscriptions on these and other monuments. All of these inscriptions are earlier than the second century B.C., in the course of which it seems likely that the language vanished from public use. The Latin colony of Aquileia was founded in 183–181 B.C., and of this we have a record on one inscription as well as in the historians¹; the earliest of the other Latin inscriptions of the district which have survived is a boundary stone dating, perhaps, from 141 or 116 B.C.²

The remains of the language,³ scanty as they are, are of considerable importance to Comparative Philology, since it is clear that they represent a type of inflexion in many ways intermediate to Greek and Latin, *e.g.*, the past tenses have no augment, but they preserve the third person ending *-to* of the middle voice. It presents some characteristics which resemble those of the Italic dialects in the strict sense of the term, *i.e.*, Oscan and Umbrian, and offers also some analogies to the language known as Eteocretan,⁴ of which at least three broken monuments have been found at Praesos in Crete,⁴ and which I have given reasons for regarding as Indo-European.

The object of this article, however, is not to enter into the interesting problems which the Venetic remains offer to a student of language, but to state two particular votive customs, to which it is desirable that some parallel should be discovered. The deity to whom the offerings were made was a goddess called *Rehtia*, about whom something will be said later on. She had a temple on the site now known as the *Fondo Baratela*, beside the modern town of Este, the ancient Ateste, about fifteen miles south of Padua. This shrine seems to have been the

¹ See, *e.g.*, *Livy* xxxix, cc. 54 and 55; and xl, 34, 2; *cf.* also xxxix, cc. 22 and 45; and *C.I.L.*, v, 873, with Mommsen's note.

² *C.I.L.*, v, 2491, *inter Atestinos et Patavinos*.

³ The inscriptions known down to 1891 were collected by Carl Pauli in his volume entitled *Die Veneter*, which was the third volume of his *Altitalische Forschungen*. The present writer is engaged in preparing a new edition of the remains, including those which have since come to light.

⁴ See the *Journal of the British School at Athens*, viii (1901–2), p. 125, and x (1903–4), p. 115.

centre of a very popular worship in the third century B.C., a worship, however, which completely declined in the course of the following century. The Museo Atestino in the town preserves among its chief treasures the rich collection of votive offerings at this temple which have come to light in the course of excavations during the last forty years, and have been reported from time to time by the distinguished Italian archæologists, Ghirardini and Prosdocimi in the *Notizie d. Scavi*, from the year 1880 onwards, especially in 1888 and 1890.

From the archæological point of view the Veneti are a people of great interest, because there can be no doubt that they lived in full possession of what is known as the Villanova culture; in other words, their life as a community goes back to the beginning of the Early Iron Age. It is beyond the scope of this article to justify this statement in detail; but the nature of the evidence will be clear to any archæologist from a comparison of the two sets of objects which are reproduced from the standard article on the Hallstatt period by Professor Hoernes.¹ Fig. 1 (Hoernes' X) gives typical forms of the three oldest strata of the Villanova age, now represented in the great museum at Bologna and known there respectively as *Benacci I.*, *Benacci II.*, and *Arnoaldi*, from the sites on which the forms were found. All three periods are regarded by archæologists as anterior to the Gallic invasion of Italy, which is placed by Livy in the sixth century B.C. (Livy v, 33 ff.).



FIG. 1.



FIG. 2.

Fig. 2 represents the oldest three strata in the excavations at Este, of which the first is roughly parallel to the two *Benacci* periods at Bologna, the second roughly parallel with the *Arnoaldi* period, and the third on the whole somewhat later. There is also at Este a fourth period, in which Gallic remains begin to appear. While the relative dates, that is the chronological succession, of these

¹ *Archiv f. Anthropologie*, Brunswick, N.S., 1905, p. 223.

periods admit, I believe, of no serious question, their actual limits in years B.C. is still subject to so much controversy that it would be imprudent to label them more precisely.

The earliest Venetic inscription yet known is on one of a group of vases from Padua, which are regarded by Italian archæologists, such as Sign. Alphonsi (who is confirmed by Sir Arthur Evans¹), as belonging to the third or to the earliest part of the fourth period at Este, that is to say, to the sixth century B.C. The inscription, of which a few letters can be seen in the right-hand vase of Fig. 3, runs thus:—

voθo kluthiari·s·vhaχ·s·θo

that is, probably, *Otho Clutearius (?) fecit.*



FIG. 3.



FIG. 4.

The reader will perhaps welcome for its own sake this introductory representation of the main features in the archæological record of a little-known people, though it is, strictly speaking, a digression from the purpose of this article. The objects to which we now proceed all belong to the later, indeed the latest, periods of the language; some specimens of one of the groups were certainly made and offered, as we shall see, at a time when knowledge of the language had become rare, so that the latest of them were probably not earlier than the second century B.C.

The most intelligible objects offered to the goddess Rehtia at Este were bronze statuettes of race-horses, of which I should be only too glad to offer a picture if any had survived. Unfortunately, all that the excavations have yet yielded of this class is a number of stone pedestals on which these small figures once stood, with the horses' hinder hoofs still embedded in cement on the top of the abacus, and with the dedicatory inscription running round the edge. By way of compensation, we may, perhaps, take Fig. 4, which is a tombstone of a charioteer at Padua, whose spirited lines admirably represent the well-known² devotion of the Veneti to this sport.

¹ See the report of the proceedings of the Brit. Acad. for July 22nd, 1908, in the *Athenæum* of August 8th of that year.

² See, e.g., Strabo v, 1, 4, and the Homeric passage (Il. 2, 852) which he quotes. But Homer is speaking of the Veneti of Paphlagonia, whom some traditions (e.g., Liv. i, 1) identify with the Veneti of Histria, not unnaturally. Strabo leaves the question open.

This class of offerings to Rehtia should be remembered as part of what we may call the normal interests of the goddess. Let us turn to the two classes of offerings whose nature needs more illustration.

RECTANGULAR BRONZE NAILS.

The first is a group of objects which look like long and solid hatpins made of bronze; the number of them is tolerably large, over 200. Out of the 200, however, only some eighteen or nineteen are inscribed, of which Figs. 1 and 2 of Plate XI give two examples; Fig. 1 showing the characteristic herring-bone ornament on the three uninscribed sides, and also two (originally three) holes in the flat handle. The other, Fig. 2, has an elaborate, though perhaps less artistic, pattern in which the original quadrangular, elongated-pyramid shape of the nail has been replaced by a rounded stiletto type, save in the portion which bears the inscription on its four sides.

Plate XI, Fig. 3, shows a better preserved specimen, but of the class which is without any articulate inscription. The marks on this specimen consist simply of letters of the Venetic alphabet, one being repeated along each of the four sides, save that at the end it is followed by two (in the second line three) vertical strokes. The letters are respectively *e*, *v*, *t*, and *z*, all of them being continually employed in the adornment of these nails. The letter *t* (X in Venetic alphabet) is particularly common, in fact of all the 180 odd specimens with letters which I have studied, only eight are without it. It is clear that some characteristic signification was attached to this symbol—familiar to our school days as the ordinary multiplication symbol in mathematics—in connection with the worship of Rehtia. Whether this significance was in any way akin to that with which the sign is, I believe, still used in letters between youthful persons of different sexes, must at present remain an open question.

Perhaps the most interesting feature of the nails is the curious objects which appear attached to the last specimen (Plate XI, Fig. 3), and to several of the others, generally at the end of small chains. These strongly confirm a suggestion made by Dr. P. Giles—that the objects represent the nails and wedges attributed, as we know from Horace,¹ to the Etruscan Goddess of Fate or Fortune, known to Romans as Nortia. It is commonly supposed that they were the symbols of her power as a master builder of the fabric of men's lives. Horace's stanza certainly suggests that he took his description from some well-known statue.

The nineteen inscriptions which contain an articulate dedication are all of one type, viz., to declare that the nail, which generally calls itself "me," is given to

¹ *Odes* I, 35, 18, addressed to Fortune :—

























Te semper anteit saeva Necessitas
clavos trabales et cuneos manu
gestans aena nec severus
uncus abest liquidumque plumbum.






Rehtia by such and such a person. Of the eighteen worshippers—for one is responsible for two offerings in the collection—probably only one is a man. The names are generally double, and the second name is sometimes in the genitive. In these cases, only two of which are quite clear, the name in the genitive is also probably feminine. So that it seems to have been a fashion among some women to describe themselves as children of their mother. More often the second name is in the same case as the first, and is sometimes of the nature of a local epithet, such as *Romana* and (probably) *Souana*; sometimes it is clearly patronymic as *Lemethorna*, from *Lemtor*; sometimes, possibly, matronymic, as in *vhouchonttiaka*, which in Latin spelling would be *Fugontiaca*. On the other hand, it is probable that the word *erimoh*, which follows the name of the solitary masculine dedicator, *exetor*, is the genitive of a masculine name. One of these inscriptions contains what looks like an ablative plural, *·u·zeroφo·s*, and might therefore be supposed to denote the occasion of the offering, *e.g.*, *at the harvest*, or *from the first-fruits*.



Can any reader of this Journal produce any record of parallel objects? Pins are by no means unknown as offerings (see below, p. 229), but I can find nothing elsewhere like the chains and wedges and lettered ornamentation.

THE BRONZE ALPHABETIC TABLETS.

The second group is one of great value, as it gives us a clear guide to the transcription of the Venetic alphabet, which in these inscriptions is written out very fully. The normal forms of its letters, as they appear when written from right to left are these:—

 a,  e,  v,  and  z,  h,  θ,  k,  l,  m,
 n,  p,  s,  r,  and  s,  t,  u,  and  φ,
 χ,  o,  i or  e.

In alternate lines of writing, the regular fashion was to change the direction, and this involved the turning round of all letters which are not symmetrically shaped, *e.g.*, in alternate lines  replaces , whereas  and  undergo no change. It may be added in passing, that although the history of this alphabet is not wholly clear, nevertheless certain features (the absence of *b*, *d*, and *g*, the perigram *vh* for *f*, and the position of  at the end) make it practically certain that it reached the Veneti through Etruscan channels.

Figs. 4 and 5 of Plate XI represent the two most complete examples of these tablets. Fig. 4, which has no handle, is uninjured save for an unimportant bruise towards the right in the sixth line (reckoned from the bottom upwards). The bronze in Fig. 5 differs from that in Fig. 4 in the last letter of the lowest line,  instead of ; and what may be called the supplementary portion, instead of proceeding

merely in straight lines to and fro, runs first round three sides of the rectangular space and then out along the handle. In both specimens, the most significant part of the writing, viz., the dedication, is embedded between the two alphabetic sections. Its beginning can be detected by the word *mexo* ($\diamond \Psi \ni \mathcal{M}$). In Plate XI, Fig. 4, this runs along the sixth line from left to right, but upside down to our eyes, and then along the right-hand edge, and finishes itself off in a second small line, which also runs parallel to the edge crossways. This inscription reads as follows:—

mexo zona-s-to e-ϕ vhaϕahtsa porah -o-posoϕo-s.

i.e., *me donavit Eb(bia) Fabatia (deae) Optimæ (?) ex (?) operibus (?) meaning fructibus*.

The dedication in Plate XI, Fig. 5, runs round three sides of the smaller rectangle bounded by the alphabetic matter which, as we have seen, provides a sort of framing or edging of the upper half of the plate. This inscription¹ reads as follows:—

mexo zona-s-to vo-l-tiomno-s iuua-n-t-s ariun-s šaknateh rehtiiah.

The two remaining examples, Plate XI, Figs. 6 and 7, are considerably broken, but they present very much the same features. Fig. 7 is no doubt the later, because after the Venetic dedication and before the second batch of alphabetic matter, it has one line in Latin containing the regular formula of a votive dedication—*dedit libens merito*. The Venetic dedications of these two present other features of considerable interest which I must not attempt to discuss here.

All the tablets have many curious points in common. They measure, roughly speaking, about 8 inches by 5 inches, and they are divided into horizontal bands, generally ten or eleven, by straight lines along the length of the tablet, the first (i.e., the lowest) five of which have a fixed character. The first, i.e., the lowest of all, contains the fifteen consonantal signs of the alphabet followed by one vowel (*e* in two examples, *i* in another, *o* in a fourth); of the next four lines each contains, sixteen times repeated, a single letter, *a* in line 2, *k* in line 3, *e* in line 4, *o* in line 5.

The alphabetic matter which follows the dedication is also practically the same in all of them. It consists mainly of successive series of combinations of the three letters, *r*, *n*, *l*, with other letters put before them (e.g., *pr*, *pn*, *pl*); the end of a series is sometimes marked by the repetition or intrusion of a single letter. There are some other variations not unimportant for the history of the alphabet, which, however, need not be explicitly pointed out, as they will appear at once from a scrutiny of the photographs.

¹ The case of the fourth word is not quite determined, but it is certainly a masculine name in Nom. or Gen. The rest probably means: *me donavit Voltiomnus . . . Arionis (filius?) Rectiae Sanatrici* (more literally *sanationi* or *sanitati*). The meaning of the puncts which appear in the middle of the line in most of the words I have discussed in *Camb. Philol. Soc. Proc.*, May 14th, 1914. I believe that they are accentual; they are not written in any syllable containing the letter *h* (which often appears as $\cdot\dot{\cdot}$), probably for merely graphical reasons.

The matter that follows the dedication in Plate XI, Fig. 4, begins in line 9 (counted from the bottom) with a more complete alphabet than that contained in line 1, since it includes the vowel symbols, *a*, *e*, *u*, in their proper places. It adds also *o* at the end instead of the *e* which concludes the consonantal series in the first line. This addition of a more complete alphabet is peculiar to this specimen, unless the top line in Plate XI, Fig. 7, which is now almost illegible, contained another example. Then follow the groups, which, however, begin from the top of the tablet, *vhr*, *vhñ*, *vgl*; *zr*, *zn*, *zl*; *θr*, *θñ*, *θl*; and so forth down to *χr*, *χñ*, *χl*.

In Plate XI, Fig. 6, the dedication is at the top of the plate instead of in the middle.

I know of no similar offerings elsewhere. The nearest alphabetic monuments would seem to be the vases of Formello,¹ Caere and Colle, which were all found in tombs, and which cannot therefore be regarded as votive. It is conceivable that the objects before us were offerings made by teachers, as a small stele containing the Ionic alphabet of the fifth century B.C., found in the Temple of Apollo at Calymna,² probably was. If so, it is remarkable that in at least one of the six specimens which we have the dedicator was certainly a woman, though in four he was certainly a man. It is worth remarking also that there is another broken tablet of the same material and of parallel shape which seems to contain a portion of the ordinary Latin alphabet and nothing else.³ The division of the boards into lines, and of a certain part of the board into squares with a fixed number, suggests the possibility of comparing them with the boards used by Greeks and Romans for playing a game of luck and skill combined, like our backgammon, called in Latin *duodecim scripta* (in Greek perhaps *πόλεις*), from the twelve lines on each side of the board which marked it out; unfortunately, no specimens of these boards seem to have survived.⁴ On that hypothesis these tablets would be dedications either by professional players or by lucky winners.⁵ Against this suggestion, however, must be set the highly elaborate character of the offerings and the care with which the alphabetic part was engraved, which would suggest, if the tablets were made on purpose for the dedication, that the worshipper's winnings must have been large.

¹ Roberts, *Introd. to Greek Epigraphy*, i, pp. 16 ff.

² Roberts, *ibid.*, p. 19.

³ Pauli (*Veneter*, Taf. II, 19) gives on p. 9 other attempted transliterations which are unconvincing, as the result resembles no known Venetic words, and does not account for several of the signs.

⁴ An actual game played by the Emperor Zeno (A.D. 474-491) is described by Agathias (*Anth. Pal.* ix, 482, a poem admirably explained by Professor Henry Jackson in the *Journal of Philology*, vii, 236). Mau's article in Pauly-Wissowa's *Realencyclopædie d. Klass. Alterthums* gives a useful account of what is otherwise known. The most important of his references are perhaps Plato Rep. x, 604c, and Quintil. xi, 2, 38. Unluckily the picture of the game given in some books of reference is taken from an inscription (Gruter, 1049), whose genuineness is open to doubt.

⁵ If so, we might identify as counters some small bronze plates found in the same excavations, bearing the symbols **✕✕**, **✕✕✕✕**, **✕✕✕✕** respectively.

Whatever the object of these Venetic tablets was, it is, I think, a reasonable inference from the features which they possess in common with the nails, that this goddess Rehtia was regarded as a being of superior intelligence, who took a particular interest in written symbols, and might be expected to be influenced by their proper use.

This deduction may, I think, be reasonably confirmed by the meaning of the name of the goddess, which can hardly be anything but *Straightness*. But what kind of straightness was implied? Was it physical straightness and erectness, such as might be represented by her votive nails, or her favourite symbol X? Or correctness in grammar? Or in morals? Or metaphysical straightness, such as that of a thunderbolt or a decree of Fate, both seeming to strike straight at their object?

The question is not solved, but one may perhaps say deepened—that is, rendered more significant—by the curious parallelism of the name with that of the great goddess whose temple at Sparta has been excavated in recent years by Mr. R. M. Dawkins and other members of the British School at Athens. Her name, as written by her worshippers there in the seventh century B.C., is *Φορθαία*, later on (in the fourth and later centuries) *Βορθεία*, where the *β* no doubt denotes some sound like English *v* descended from the original *w*. Greek writers generally¹ call her *Ὀρθία*, and connect the name with Attic *ὀρθός*, “straight”; its meaning, therefore, is identical with that of the Venetic name *Rehtia*. This, however, does not in itself compel us to identify the two, as the translation of divine names in ancient times, though not unknown, is rare. The difficulty, however, might be solved by regarding both the words not as names, strictly speaking, but only as epithets, like *Κόρη* and *Virgo*, *Πίστιος* and *Fidius*.

In the full accounts given by Mr. R. M. Dawkins, Professor R. C. Bosanquet and others, in the *Annual of the British School at Athens*,² many archaeologists³ have found grounds for thinking that this goddess is to be identified with the great Nature-goddess mostly called Artemis, worshipped in historical times at many points of the Mediterranean coast, and also, apparently, in Crete in the Minoan periods.⁴ The Spartan Orthia patronized the *παιδικὸς ἀγών* (or *καρτερίας ἀγών*) at which boys competed in power of endurance under the lash down to the fourth century A.D. She is continually associated with wild creatures, birds, beasts and snakes, and enjoys various epithets, *Aphaia* at Argos, *Gygaea* in Lydia, *Parthenos Agrotera*, and *Φορθαία* at Sparta, *Orthia* at Epidauros. In this last place she was associated with *Asklepios Orthios* to make a pair of healing deities;

¹ *E.g.*, Pausan. 3, 16, 6; Alcman's *Parthenion* (Bergk. *Poet. Lyr.* iii, 23–44) was an ode to Artemis Orthia (see line 61), performed at the Spartan temple; see further Athenaeus xiv, 646A, and Xenophon (*Cyneg.* vi, 13; *Hellen.* iv, 2, 20), who calls her Artemis Agrotera and also Agrotera simply.

² xii (1906), pp. 279 ff., especially pp. 321 ff. and 331 ff.; xiii (1907), pp. 78 ff. and 107 ff.; xiv, p. 63; xv, p. 19; xvi, p. 17.

³ For example, Sir Arthur Evans, in his remarks upon the abstract of this paper, which was laid before Section H of the British Association at Manchester last September.

⁴ See, *e.g.*, Burrows' *Discoveries in Crete*, pp. 114 ff., 137 ff., and the authorities he cites.



FIG. 1.



FIG. 2.

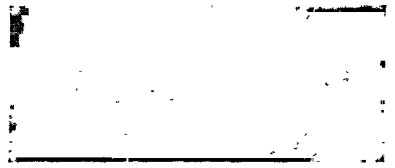


FIG. 3.

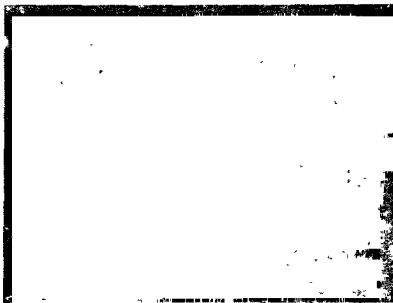


FIG. 4.



FIG. 5.

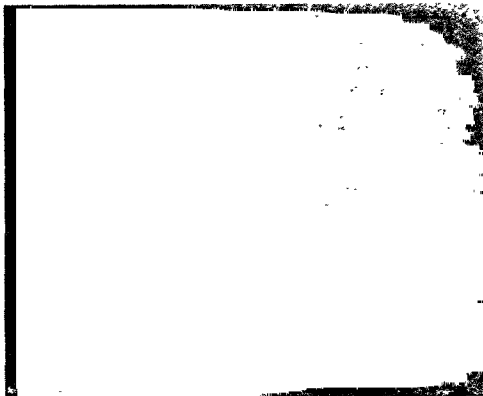


FIG. 6.

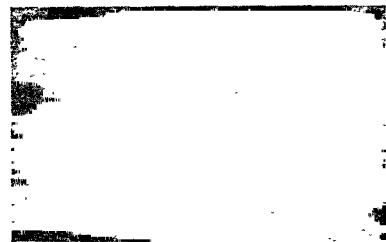


FIG. 7.

SOME VOTIVE OFFERINGS TO THE VENETIC GODDESS REHTIA.

and in this sense, of 'the Restorer,' her name was understood by Pindar¹; especially, according to the ancient commentator on Pindar, as restoring women to health after child-birth, and preserving their infants. That she loved horses appears from several dedications, especially one of a striking bas-relief of the seventh century B.C.² Less serious interests are suggested by the dedication to her of dice, or *teetotums*,³ of a curious, roughly oval shape, divided into six segments by longitudinal bands, each segment pierced by a certain number of holes, 1, 2, etc., up to 6, and used by rolling. Other small objects of a thimble shape with movable lids or "crowns," which were probably used in some game, and a great number of knuckle-bones, the most primitive form of dice, were found in the Archaic stratum (seventh to sixth century B.C.) of the Spartan remains.⁴ Further, among the remains in this stratum were "pieces of sheet-bronze with an incised pattern imitating plaited strands"—a pattern which has also been "found at Olympia on fragments of shields and regarded as Argive or Corinthian work of the sixth century B.C."

A large number of bronze pins were also found here,⁵ and in other shrines of the goddess, but with none of the features that specially mark those at Este; the Greek specimens are round, have solid, lumpy heads, and no chains or wedges or rectangular ornament.

It is further very tempting to connect with the healing functions of Orthia the epithet *Sanatis* (if that be its Venetic nominative) of Rehtia at Este; the dedication of figures of horses to both goddesses is also noteworthy; and the use of horses in the festivals of Orthia is mentioned by Alcman (*Parthenion*, line 50), who actually points to the 'Venetic steed' (ὁ μὲν κέλης Ἑνετικός) as a feature of distinction in the celebration worthy to be set beside the beauty of the chief maiden celebrant, his niece Agesichora, whose 'hair flowers upon her shoulders like pure gold.' If only he had told us whether the steed was reared in Asia Minor or the plains of N.E. Italy! Further, it is tempting to connect Orthia's dice and patterned sheets of bronze with Rehtia's alphabetic tablets. Finally, even a glance at any of the sixth-century figures of Orthia will show that she liked straight lines, and revelled in geometric ornament, at that date. In one of the ivory figures reproduced by Mr. Dawkins her arms are held straight down her sides and the fingers of each hand are stretched out tightly downwards.⁶ If the evidence, especially that of Alcman, be thought to warrant the identification of Rehtia with Orthia, then what we may call the marked rectangularity of the Venetic goddess suggests an interesting deduction as to the date of her migration northward, which must have been, it would seem, at some period earlier than the disappearance of the geometric style from her toilet.

¹ *Olymp.*, 3, 54; he calls her Ὀρθωσία, and so she was known at Athens and elsewhere.

² *Br. Sch. Ath. Ann.*, xii, pp. 334 and 353.

³ *Br. Sch. Ath. Ann.*, xiii, p. 115, a dedication of the sixth century B.C.

⁴ R. M. Dawkins, in *Br. Sch. Ath. Ann.*, xii, p. 327.

⁵ J. P. Droop, *Br. Sch. Ath. Ann.*, xiii, p. 110.

⁶ *Br. Sch. Ath. Ann.*, xiii, p. 106 and compare the terra-cotta figurine on p. 107.

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ERRATA.

VOLUME XLVI, 1916, JULY-DECEMBER.

Page 439, line 7 from bottom, *for* At'ola, *read* Al-'ola.

Page 440, under the two groups of figures, *read* B, C.

Plate XXV, *for* A *read* A1.

Plate XXVI, *for* B *read* A2.

Plate XXVII, *for* C *read* A3.



ANCIENT STORIES OF A GREAT FLOOD.

The Huxley Memorial Lecture for 1916.

By SIR JAMES GEORGE FRAZER.

§1. INTRODUCTION.

WHEN the Council of the Royal Anthropological Institute invited me to deliver the annual Huxley Lecture, I gratefully accepted the invitation, esteeming it a high honour to be thus associated with one for whom, both as a thinker and a man, I entertain a deep respect, and with whose attitude towards the great problems of life I am in cordial sympathy. His own works will long keep his memory green ; but it is fitting that our science should lay, year by year, a wreath on the grave of one of the most honoured of its exponents.

Casting about for a suitable subject on which to address you, I remembered that in his later life Huxley devoted some of his well-earned leisure to examining those traditions as to the early ages of the world which are recorded in the Book of Genesis ; and accordingly I thought that I might appropriately take one of them for the theme of my discourse. The one which I have chosen is the familiar story of the Great Flood. Huxley himself discussed it in an instructive essay written with all the charm of his lucid and incisive style.¹ His aim was to show that, treated as a record of a deluge which overwhelmed the whole world, drowning almost all men and animals, the story conflicts with the plain teaching of geology, and must be rejected as a fable. I shall not attempt either to reinforce or to criticize his arguments and his conclusions, for the simple reason that I am no geologist, and that for me to express an opinion on such a matter would be a mere impertinence. I have approached the subject from a different side, namely, from that of tradition. It has long been known that legends of a great flood, in which almost all men perished, are widely diffused over the world ; and accordingly what I have tried to do is to collect and compare these legends, and to inquire what conclusions are to be deduced from the comparison. In short, my discussion of the stories is a study in comparative folk-lore. My purpose is to discover how the narratives arose and how they came to be so widespread over the earth ; with the question of their truth or falsehood I am not primarily concerned, though, of course, it cannot be ignored in considering the problem of their origin. The inquiry thus defined is not a novel one. It has often been attempted, especially in

¹ "Hasisadra's Adventure," *Collected Essays*, vol. iv (London, 1911), pp. 239-296.

recent years, and in pursuing it I have made abundant use of the labours of my predecessors, some of whom have discussed the subject with great learning and ability. In particular I would acknowledge my debt to the eminent German geographer and anthropologist, the late Dr. Richard Andree, whose monograph on diluvial traditions, like all his writings, is a model of sound learning and good sense, set forth with the utmost clearness and conciseness.¹

But the theme of deluge legends is too large to be treated of adequately within the compass of a single lecture, and instead of attempting to give you a comprehensive view of the whole subject, which would be apt to degenerate into a mere catalogue of legends and a bare statement of conclusions without the evidence on which they are based, I propose to confine our attention this evening to a few conspicuous instances of diluvial traditions and to handle these somewhat fully, believing that this mode of treatment is likely to prove more interesting to my hearers and to furnish them with more ample means of testing the value of my conclusions. The particular traditions which I have selected for discussion are the most famous and the most familiar of all, namely, the stories of a great flood which are recorded in the ancient literatures of Babylonia, Palestine, and Greece. What I have to say about similar tales discovered in other parts of the world must be reserved for another time and another place. But before I address myself to the particular legends to which I have the honour of inviting your attention to-night, permit me to make a single general observation on the study of diluvial traditions as a whole.

Apart from the intrinsic interest of such legends as professed records of a catastrophe which destroyed at a blow almost the whole human race, they deserve to be studied for the sake of their bearing on a general question which is at present warmly debated among anthropologists. That question is, How are we to explain the numerous and striking similarities which obtain between the beliefs and customs of races inhabiting distant parts of the world? Are such resemblances due to the transmission of the customs and beliefs from one race to another, either

¹ R. Andree, *Die Flutsagen* (Brunswick, 1891). Other notable discussions of the same theme in recent years are the following: H. Usener, *Die Sintflutsagen* (Bonn, 1899); *id.*, "Zu den Sintfluthsagen," *Kleine Schriften*, iv (Berlin, 1913), pp. 382-396; M. Winternitz, *Die Flutsagen des Alterthums und der Naturvölker* (Vienna, 1901) (reprinted from *Mittheilungen der anthropologischen Gesellschaft in Wien*, vol. xxxi); E. Böklen, "Die Sintflutsage, Versuch einer neuen Erklärung," *Archiv für Religionswissenschaft*, vi (1903), pp. 1-61, 97-150; G. Gerland, *Der Mythos von der Sintflut* (Bonn, 1912). Of these works, that of Winternitz contains a useful list of flood legends, with references to the authorities and a full analysis of the principal incidents in the legends. Like the treatise of R. Andree, it is characterized by the union of accurate learning and good sense. On the other hand, the works of Usener, Böklen, and Gerland are vitiated by their far-fetched and improbable theories as to the origin of the legends in solar or lunar myths. But in spite of this defect, Gerland's treatise is valuable for the number of parallel legends which the author's ethnological learning has collected from many races. Among earlier discussions of the same theme may be mentioned Philipp Buttmann, "Ueber den Mythos der Sündflut," *Mythologus* (Berlin, 1828-1829), i, 180-214; François Lenormont, *Les Origines de l'Histoire d'après la Bible, de la Création de l'Homme au Déluge* (Paris, 1880), pp. 382-491.

through immediate contact or through the medium of intervening peoples? Or have they arisen independently in many different races through the similar working of the human mind under similar circumstances? Now, if I may presume to offer an opinion on this much-debated problem, I would say at once that, put in the form of an antithesis between mutually exclusive views, the question seems to me absurd. So far as I can judge, all experience and all probability are in favour of the conclusion that both causes have operated extensively and powerfully to produce the observed similarities of custom and belief among the various races of mankind; in other words, many of these resemblances are to be explained by simple transmission, with more or less of modification, from people to people, and many are to be explained as having originated independently through the similar action of the human mind in response to similar environment. If that is so—and I confess to thinking that this is the only reasonable and probable view—it will follow that in attempting to account for any particular case of resemblance which may be traced between the customs and beliefs of different races, it would be futile to appeal to the general principle either of transmission or of independent origin; each case must be judged on its own merits after an impartial scrutiny of the facts, and referred to the one or the other principle, or possibly to a combination of the two, according as the balance of evidence inclines to the one side or to the other, or hangs evenly between them.

Now this general conclusion, which accepts the two principles of transmission and independent origin as both of them true and valid within certain limits, is confirmed by the particular investigation of diluvial traditions. For it is certain that legends of a great flood are found dispersed among many diverse peoples in distant regions of the earth, and so far as demonstration in such matters is possible, it can be demonstrated that the similarities which undoubtedly exist between many of these legends are partly due to direct transmission from one people to another, and partly to similar, but quite independent, experiences either of great floods or of phenomena which suggested the occurrence of great floods, in many different parts of the world. Thus the study of these traditions, quite apart from any conclusions to which it may lead us concerning their historical credibility, may serve a useful purpose if it mitigates the heat with which the controversy has sometimes been carried on, by convincing the extreme partisans of both principles that in this, as in so many other disputes, the truth lies wholly neither on the one side nor on the other, but somewhere between the two.

So much for the study of flood stories in general. I now turn to the particular consideration of the flood stories current in sacred and classical antiquity.

§2. THE BABYLONIAN STORY OF A GREAT FLOOD.

Of all the legends of a great flood recorded in literature, by far the oldest is the Babylonian, or, rather, the Sumerian; for we now know that, ancient as was the Babylonian version of the story, it was derived by the Babylonians from their

still more ancient predecessors, the Sumerians, from whom the Semitic inhabitants of Babylonia appear to have derived the principal elements of their civilization.

The Babylonian tradition of the Great Flood has been known to Western scholars from the time of antiquity, since it was recorded by the native historian Berosus, who composed a history of his country in the first half of the third century before our era. Berosus wrote in Greek, and his work has not come down to us, but fragments of it have been preserved by later Greek historians, and among these fragments is, fortunately, his account of the Deluge. It runs as follows:—¹

“The Great Flood took place in the reign of Xisuthrus, the tenth king of Babylon. Now the god Cronus appeared to him in a dream and warned him that all men would be destroyed by a flood on the fifteenth day of the month Daesius, which was the eighth month of the Macedonian calendar.² Therefore the god enjoined him to write a history of the world from the beginning and to bury it for safety in Sippar, the city of the Sun.³ Moreover, he was to build a ship and embark in it with his kinsfolk and friends, and to lay up in it a store of meat and drink, and to bring living things, both fowls and four-footed beasts, into the ship,

¹ Eusebius, *Chronicorum Liber Prior*, ed. A. Schoene (Berlin, 1875), coll. 19 *sqq.*; *Fragmenta Historicorum Graecorum*, ed. C. Müller, ii (Paris, 1878), pp. 501 *sq.* Eusebius had not the original work of Berosus before him. He copied from Julius Africanus, who copied from Alexander Polyhistor (a contemporary of Sulla in the first century B.C.), who copied from Apollodorus, who may have copied from Berosus himself. See C. Müller, *Fragmenta Historicorum Graecorum*, ii, 496. Even the original Greek text of Eusebius is lost and is known only through an Armenian translation, of which a Latin version is printed by A. Schoene and C. Müller, *ll.cc.* A Greek version of the Babylonian legend is preserved in the chronicle of the Christian writer, Georgius Syncellus, who lived at the end of the eighth and the beginning of the ninth century. The Greek version of Syncellus is printed side by side with the Latin translation of Eusebius's version in A. Schoene's edition of Eusebius's *Chronicle* and in C. Müller's *Fragmenta Historicorum Graecorum*, *ll.cc.*

² L. Ideler, *Handbuch der mathematischen und technischen Chronologie* (Berlin, 1825), i, 393, 402 *sq.*; W. Smith, *Dictionary of Greek and Roman Antiquities*, third edition (London, 1890–1891), i, 338 *sq.*, *s.v.* “Calendar.” The date is probably derived from Berosus himself, who, writing in Greek under the Macedonian empire, would naturally use the Macedonian calendar. However, we cannot say at what time of the year the month Daesius fell at Babylon in the time of Berosus, and consequently we do not know at what time of the year he supposed the Deluge to have occurred. For though the *order* of the months in the Macedonian calendar was the same everywhere, their *dates* fell differently in different places. See *The Dying God*, p. 116, note ¹. In one passage (*Aratus* 53) Plutarch tells us that the Macedonian month Daesius was equivalent to the Attic month Anthesterion, which roughly corresponded to our February. But elsewhere he says that the battle of Granicus was fought in the Macedonian month Daesius (*Alexander*, 16) and the Attic month Thargelion (*Camillus*, 19), which was approximately equivalent to our May.

³ Κελεῦσαι εὖν διὰ γραμμάτων πάντων ἀρχὰς καὶ μέσα καὶ τελευτὰς ὀρύξαντα θείναι ἐν πόλει ἡλίου Σιπάρῳ. The Greek is peculiar and ambiguous. ὀρύξαντα, “having dug,” might mean either that he was to bury the record in the ground or to dig it up. The corresponding word in the Armenian version of Eusebius is said to be equally ambiguous. I have preferred the former sense as more appropriate and as confirmed by the sequel (see below, p. 235). Σιπάρῳ is a correction of Scaliger for the manuscript reading Σισπάρῳ. In modern times many thousands of clay tablets containing records of legal transactions have been found in the ancient Babylonian city of Sippar. See Morris Jastrow, *The Religion of Babylonia and Assyria* (Boston, 1898), p. 10.

and when he had made all things ready he was to set sail. And when he asked, 'And whither shall I sail?' the god answered him, 'To the gods; but first thou shalt pray for all good things to men.' So he obeyed and built the ship, and the length of it was five furlongs,¹ and the breadth of it was two furlongs; and when he had gathered all things together he stored them in the ship and embarked his children and friends. And when the flood had come and immediately abated, Xisuthrus let fly some of the birds. But as they could find no food nor yet a place to rest, they came back to the ship. And again, after some days, Xisuthrus let fly the birds; and they returned again to the ship with their feet daubed with clay. A third time he let them fly, and they returned no more to the vessel. Then Xisuthrus perceived that the land had appeared above the water; so he parted some of the seams of the ship, and looking out he saw the shore, and drove the ship aground on a mountain, and stepped ashore with his wife, and his daughter, and the helmsman. And he worshipped the ground, and built an altar; and when he had sacrificed to the gods, he disappeared with those who had disembarked from the ship. And when those who had remained in the ship saw that he and his company returned not, they disembarked likewise and sought him, calling him by name. But Xisuthrus himself was nowhere to be seen. Yet a voice from the air bade them fear the gods, for that he himself for his piety was gone to dwell with the gods, and that his wife, and his daughter, and the helmsman partook of the same honour. And he commanded them that they should go to Babylon, and take up the scriptures which they had buried, and distribute them among men. Moreover, he told them that the land in which they stood was Armenia. And when they heard these things, they sacrificed to the gods and journeyed on foot to Babylon. But of the ship that grounded on the mountains of Armenia a part remains to this day, and some people scrape the bitumen off it and use it in charms. So when they were come to Babylon they dug up the scriptures in Sippar, and built many cities, and restored the sanctuaries, and repeopled Babylon."

According to the Greek historian Nicolaus of Damascus, a contemporary and friend of Augustus and of Herod the Great, "there is above Minyas in Armenia a great mountain called Baris, to which, as the story goes, many people fled for refuge in the Flood and were saved: they say, too, that a certain man, floating in an ark, grounded on the summit, and that remains of the timbers were preserved for a long time. The man may have been he who was recorded by Moses, the legislator of the Jews."² Whether Nicolaus of Damascus drew this information from Babylonian or Hebrew tradition may be doubted: the reference to Moses

¹ The Armenian text of Eusebius stretches the length of the ship to *fifteen* furlongs, or nearly two miles, which seems exorbitant when we consider the state of the shipbuilding industry in the days before the Flood. No modern dock would hold such a vessel.

² Nicolaus Damascenus, quoted by Josephus, *Antiquit. Jud.*, i, 3, 6; *Fragmenta Historicorum Graecorum*, ed. C. Müller, ii, 415, Frag. 76. For Minyas some scholars would substitute Milyas in the text, comparing Pliny, *Nat. Hist.*, v, 147, "*Attingit Galatia et Pamphyliæ Cabaliam et Milyas qui circa Barim sunt.*" The reading Minyas is retained by C. Müller and defended by A. Reinach, *Noé Sangariou* (Paris, 1913), pp. 47 *sqq.*

seems to show that he was acquainted with the narrative in Genesis, which he may easily have learned through his patron Herod.

For many centuries the Babylonian tradition of a great flood was known to Western scholars only through its preservation in the Greek fragments of Berosus; it was reserved for modern times to recover the original Babylonian version from the long-lost archives of Assyria. In the course of those excavations at Nineveh, which were one of the glories of the nineteenth century, and which made an epoch in the study of ancient history, the English explorers were fortunate enough to discover extensive remains of the library of the great king Ashurbanipal, who reigned from 668 to 626 B.C. in the splendid sunset of the Assyrian empire, carrying the terror of his arms to the banks of the Nile, embellishing his capital with magnificent structures, and gathering within its walls from far and near a vast literature, historical, scientific, grammatical and religious, for the enlightenment of his people.¹ The literature, of which a great part was borrowed from Babylonian originals, was inscribed in cuneiform characters on tablets of soft clay, which were afterwards baked hard and deposited in the library. Apparently the library was arranged in an upper story of the palace, which, in the last sack of the city, collapsed in the flames, shattering the tablets to pieces in its fall. Many of them are still cracked and scorched by the heat of the burning ruins. In later ages the ruins were ransacked by antiquaries of the class of Dusterswivel, who sought among them for the buried treasures not of learning but of gold, and by their labours contributed still further to the disruption and disintegration of the precious records. To complete their destruction the rain, soaking through the ground every spring, saturates them with water containing chemicals, which form in every crack and fissure crystals that by their growth split the already broken tablets into minuter fragments. Yet by laboriously piecing together a multitude of these fragments George Smith, of the British Museum, was able to recompose the now famous epic of Gilgamesh in twelve cantos, or rather tablets, the eleventh of which contains the Babylonian story of the Deluge. The great discovery was announced by Mr. Smith at a meeting of the Society of Biblical Archaeology on December the 3rd, 1872.²

It was ingeniously conjectured by Sir Henry Rawlinson that the twelve cantos of the Gilgamesh epic corresponded to the twelve signs of the zodiac, so that the course of the poem followed, as it were, the course of the sun through the twelve months of the year. The theory is to some extent confirmed by the place assigned to the Flood legend in the eleventh canto; for the eleventh Babylonian month fell at the height of the rainy season, it was dedicated to the storm-god Ramman, and its name is said to signify "month of the curse of rain."³ Be that

¹ Morris Jastrow, *The Religion of Babylonia and Assyria* (Boston, U.S.A., 1896), p. 43.

² George Smith, *The Chaldean Account of Genesis*, a new edition revised and corrected by A. H. Sayce (London, 1880), pp. 1 *sqq.*

³ E. Schrader, *The Cuneiform Inscriptions and the Old Testament*, translated by O. C. Whitehouse (London and Edinburgh, 1885), i, 47; M. Jastrow, *The Religion of Babylonia and*

as it may, the story as it stands is an episode or digression destitute of all organic connection with the rest of the poem. It is introduced as follows.¹

The hero of the poem, Gilgamesh, has lost his dear friend Engidu² by death, and he himself has fallen grievously sick. Saddened by the past and anxious for the future, he resolves to seek out his remote ancestor Ut-napishtim,³ son of Ubara-Tutu, and to inquire of him how mortal man can attain to eternal life. For surely, he thought, Ut-napishtim must know the secret, since he has been made like to the gods and now dwells somewhere far away in blissful immortality. A weary and a perilous journey must Gilgamesh accomplish to come at him. He passes the mountain, guarded by a scorpion man and woman, where the sun goes down: he traverses a dark and dreadful road never trodden before by mortal man: he is ferried across a great sea: he crosses the Water of Death by a narrow bridge, and at last he enters the presence of Ut-napishtim.⁴ But when he puts to his great ancestor the question, how man may attain to eternal life, he receives a discouraging reply: the sage tells him that immortality is not for man. Surprised at this answer from one who had been a man and was now himself immortal, Gilgamesh naturally asks his venerable relative to explain how he had contrived

Assyria (Boston, 1898), pp. 463, 484, 510; *id.*, *Hebrew and Babylonian Myths*, p. 325, note ¹. According to Schrader, "the Akkadian name of the month, *iti aša šēgi*=Assyrian *arāh arrat sunni*, signifies 'month of the curse of rain,' i.e., 'month of the judgment of the Flood.'" Further correspondences between the cantos and the months are noted by Professor Jastrow, *ll.c.*

¹ For translations or summaries of the Deluge legend, see Eberhard Schrader, *The Cuneiform Inscriptions and the Old Testament*, translated by Rev. Owen C. Whitehouse (London and Edinburgh, 1885-1888), i, 46 *sqq.*; M. Jastrow, *The Religion of Babylonia and Assyria* (Boston, 1898), pp. 495 *sqq.*; *id.*, *Hebrew and Babylonian Traditions* (London, 1914), pp. 325 *sqq.*; L. W. King, *Babylonian Religion and Mythology* (London, 1899), pp. 127 *sqq.*; P. Jensen, *Assyrisch-Babylonische Mythen und Epen* (Berlin, 1900), pp. 229 *sqq.*; W. Muss-Arnolt, in R. F. Harper's *Assyrian and Babylonian Literature* (New York, 1901), pp. 350 *sqq.*; H. Zimmern, in E. Schrader's *Die Keilinschriften und das Alte Testament*, Dritte Auflage (Berlin, 1902), pp. 544 *sqq.*; Alfred Jeremias, *Das Alte Testament im Lichte des Alten Orients*, Zweite Auflage (Berlin, 1906), pp. 228 *sqq.*; P. Dhorme, *Choix de Textes Religieux Assyro-Babyloniens* (Paris, 1907), pp. 100 *sqq.*; Arthur Ungnad, in H. Gressmann's *Altorientalische Texte und Bilder zum Alten Testament* (Tübingen, 1909), i, 50 *sqq.*; A. Ungnad, *Das Gilgamesch-Epos* (Göttingen, 1911), pp. 52 *sqq.*; R. W. Rogers, *Cuneiform Parallels to the Old Testament* (Oxford [1912]), pp. 90 *sqq.* Of these works the translations of Jensen, Dhorme, and Rogers are accompanied by the original Babylonian text printed in Roman characters. The version in the text is based on a comparison of these various renderings.

² The name is said to be Sumerian, meaning "Enki (Semitic Ea) is Creator." See A. Ungnad und H. Gressmann, *Das Gilgamesch-Epos*, pp. 75 *sq.* The name was formerly read Eabani.

³ The name is said to mean "He saw (*āta, āt*) life," in the sense of "He found life." See H. Zimmern, in E. Schrader's *Die Keilinschriften und das Alte Testament*,³ p. 545, note ². Compare P. Jensen, *Assyrisch-Babylonische Mythen und Epen*, p. 466; A. Ungnad und H. Gressmann, *Das Gilgamesch-Epos*, p. 80. The name was formerly read as Par-napishtim, Per-napishtim, or Tsit-napishtim.

⁴ As to the journey, narrated in the ninth and tenth cantos of the poem, see M. Jastrow *The Religion of Babylonia and Assyria*, pp. 487-492; L. W. King, *Babylonian Religion and Mythology*, pp. 165-171; A. Ungnad und H. Gressmann, *Das Gilgamesch-Epos*, pp. 134-139.

to evade the common doom. It is in answer to this pointed question that Ut-napishtim tells the story of the Great Flood, which runs as follows:—

Ut-napishtim spoke to him, to Gilgamesh: "I will reveal to thee, O Gilgamesh, a hidden word, and the purpose¹ of the gods will I declare to thee. Shurippak, a city which thou knowest, which lies on the bank of the Euphrates, that city was old;² and the gods within it, their heart prompted the great gods to send a flood.³ There was their father Anu, their counsellor the warrior Enlil,⁴ their messenger Ninib, their prince Ennugi. The Lord of Wisdom, Ea, sat also with them, he repeated their word to the hut⁵ of reeds, saying, 'O reed hut, reed hut, O wall, wall, O reed hut hearken, O wall attend. O man of Shurippak, son of Ubara-Tutu, pull down thy house, build a ship, forsake thy possessions, take heed for thy life! Thy gods abandon, save thy life, bring living seed of every kind into the ship. As for the ship which thou shalt build, well planned must be its dimensions, its breadth and its length shall bear proportions each to each, and thou shalt launch it in the ocean.'⁶ I took heed and spake unto Ea, my lord, saying, 'The command, O my lord, which thou hast given, I will honour and will fulfil. But how shall I make answer unto the city, the people and the elders thereof?' Ea opened his mouth and spake, and he said unto me his servant, 'Thus shalt thou answer and say unto them: Because Enlil hates me, no longer may I abide in your city nor lay my head on Enlil's earth. Down into the deep sea must I go with Ea, my lord, to dwell.'" So Ut-napishtim obeyed the god Ea and gathered together the wood and all things needful for the building of the ship, and on the fifth day he laid down the hull. In the shape of a barge he built it, and on it he set a house a hundred and twenty cubits high, and he divided the house into six stories, and

¹ Or "decision" (M. Jastrow, R. W. Rogers), "secret" (P. Jensen, A. Jeremias, P. Dhorme, A. Ungnad), "mystery" (W. Muss-Arnolt). The same Assyrian word (*pirishtu*) occurs again twice towards the end of the canto. See below, p. 241. It may be connected with the Hebrew verb *parash* (פָּרַשׁ), "make distinct, declare," with which the lexicographers compare the Assyrian *parāsu*. See W. Gesenius, *Hebräisches und Aramäisches Handwörterbuch*,¹⁴ ed., F. Buhl (Leipzig, 1905), p. 604. The "purpose" or "decision" in question is the resolve of the gods to bring a flood upon the world.

² H. Zimmern proposed, by a slight change of reading, to translate "that city was not pious" (E. Schrader, *Die Keilinschriften und das Alte Testament*,³ p. 546, note 6). This would assign the wickedness of the city as the cause of its destruction by the flood. But the suggested reading and rendering have not been accepted by later editors and translators.

³ "Or the gods thereof induced the great gods to bring a cyclone over it" (M. Jastrow, *Hebrew and Babylonian Traditions*, p. 326).

⁴ Or Illil, less correctly Ellil. The name was formerly read Bel (so Jensen and Dhorme, and formerly Jastrow). Enlil is the Sumerian name of the god, Bel is his Semitic name. Together with Anu, the Father of the Gods, and Enki (the Semitic Ea), he made up the highest trinity of the ancient Sumerians. See L. W. King, *Babylonian Religion and Mythology*, p. 14; A. Ungnad und H. Gressmann, *Das Gilgamesch-Epos*, p. 76.

⁵ Or perhaps rather "fence." So Dhorme translates it, "*haie de roseaux*." As to the hut or wall of reeds, see below, pp. 244 sq.

⁶ Or "On a level with the deep, provide it with a covering" (M. Jastrow, *Hebrew and Babylonian Traditions*, p. 326). ". . . the ocean, cover it with a roof" (R. W. Rogers). Similarly A. Ungnad (*Das Gilgamesch-Epos*, p. 53).

in each story he made nine rooms. Water-plugs he fastened within it; the outside he daubed with bitumen, and the inside he caulked with pitch. He caused oil to be brought, and he slaughtered oxen and lambs. He filled jars with sesame-wine and oil and grape-wine; he gave the people to drink like a river and he made a feast like to the feast of the New Year. And when the ship was ready he filled it with all he had of silver, and all that he had of gold, and all that he had of living seed. Also he brought up into the ship all his family and his household, the cattle of the field likewise and the beasts of the field, and the handicraftsmen: all of them he brought in. A fixed time the sun-god Shamash had appointed, saying, "At eventide the lord of darkness will send a heavy rain. Then enter thou into the ship and shut thy door." The time appointed drew near, and at eventide the lord of the darkness sent a heavy rain. Of the storm, I saw the beginning, to look upon the storm I was afraid. I entered into the ship and shut the door. To the pilot of the ship, even to Puzur-Amurri, the sailor, I committed the (floating) palace¹ and all that therein was. When the early dawn appeared there came up from the horizon a black cloud. Ramman² thundered in the midst thereof, the gods Mujati³ and Lugal⁴ went before. Like messengers they passed over mountain and land; Irragal⁵ tore away the ship's post. There went Ninib and he made the storm to burst. The Anunnaki lifted up flaming torches, with the brightness thereof they lit up the earth. The whirlwind of Ramman² mounted up into the heavens, and all light was turned into darkness." A whole day the tempest raged, and the waters rose on the mountains. "No man beheld his fellow, no more could men know each other. In heaven the gods were afraid of the deluge, they drew back, they climbed up into the heaven of Anu. The gods crouched like dogs, they cowered by the walls. Ishtar cried out like a woman in travail, loudly lamented the queen of the gods with her beautiful voice: Let that day be turned to clay, when⁶ I commanded evil in the assembly of the gods! Alas, that I commanded evil in the assembly of the gods, that for the destruction of my

¹ The ship is so called because of its many stories and apartments. The Assyrian word here employed (*ekallu*) is the same with the ordinary Hebrew word for a palace or temple (מִקְדָּשׁ *hekal*). See E. Schrader, *The Cuneiform Inscriptions and the Old Testament*, i, 56; P. Dhorme, *Choix de Textes Religieux Assyro-Babyloniens*, p. 109, note ⁹⁶; Fr. Brown, S. R. Driver, and Ch. A. Briggs, *Hebrew and English Lexicon* (Oxford, 1906), p. 228.

² So L. W. King and A. Ungnad (*Das Gilgamesch-Epos*, p. 56). Others read "Adad" (so Jensen, Jeremias, and formerly Ungnad). Ramman or Adad was the god of thunder and storms. His name is written AN.IM. See A. Ungnad und H. Gressmann, *Das Gilgamesch-Epos*, p. 79.

³ A minor deity, afterwards identified with Nabu (Nebo). See A. Ungnad und H. Gressmann, *Das Gilgamesch-Epos*, p. 78.

⁴ A minor deity, the herald of the gods. His name means "King," a title bestowed on Marduk. Hence some translators render it by "Marduk" in the present passage. See A. Ungnad und H. Gressmann, *Das Gilgamesch-Epos*, p. 78.

⁵ Irragal or Irrakal is "the Great Irra," the god of pestilence, more commonly known as Nergal. See A. Ungnad und H. Gressmann, *Das Gilgamesch-Epos*, pp. 77, 78.

⁶ So Jensen, Dhorme, and Jastrow (*Hebrew and Babylonian Traditions*, p. 331). Others translate, "The former time (that is, the old race of man) has been turned into clay, because——"

people I commanded battle! That which I brought forth, where is it? Like the spawn of fish it filleth the sea. The gods of the Anunnaki¹ wept with her, the gods were bowed down, they sat down weeping. Their lips were pressed together. For six days and six nights the wind blew, and the deluge and the tempest overwhelmed the land. When the seventh day drew nigh, then ceased the tempest and the deluge and the storm, which had fought like a host. Then the sea grew quiet, it went down; the hurricane and the deluge ceased. I looked upon the sea, there was silence come,² and all mankind was turned back into clay. Instead of the fields a swamp lay before me.³ I opened the window and the light fell upon my cheek; I bowed myself down, I sat down, I wept, over my cheek flowed my tears. I looked upon the world, and behold all was sea. After twelve (days?)⁴ an island arose, to the land Nisir the ship made its way. The mount of Nisir⁵ held the ship fast and let it not slip. The first day, the second day, the mountain Nisir held the ship fast: the third day, the fourth day, the mountain Nisir held the ship fast: the fifth day, the sixth day, the mountain Nisir held the ship fast. When the seventh day drew nigh, I sent out a dove, and let her go forth. The dove flew hither and thither, but there was no resting-place for her and she returned. Then I sent out a swallow and let her go forth. The swallow flew hither and thither, but there was no resting-place for her, and she returned. Then I sent out a raven and let her go forth. The raven flew away, she beheld the abatement of the waters, she ate,⁶ she waded, she croaked, but she did not return. Then I brought all out unto the four winds, I offered an offering, I made a libation on the peak of the mountain. By sevens I set out the vessels, under them I heaped up reed, and cedar-wood, and myrtle.⁷ The gods smelt the savour, the gods smelt the sweet savour. The gods gathered like flies about him that offered up the sacrifice. Then the Lady of the gods drew nigh, she lifted up the great jewels which Anu had made according to her wish. She said, 'Oh ye gods here, as truly as I will not forget the jewels of *lapis lazuli* which are on my neck, so truly will I remember these days, never shall I forget them! Let the gods come

¹ Or "because of the Anunnaki" (P. Dhorme), "over the Anunnaki" (W. Muss-Arnolt).

² Or "and cried aloud" (so L. W. King, W. Muss-Arnolt, and doubtfully A. Jeremias).

³ "The swamp reached to the roofs" (so P. Dhorme), "Like a roof the plain lay level" (R. W. Rogers). See E. Schrader, *The Cuneiform Inscriptions and the Old Testament*, translated by O. C. Whitehouse (London and Edinburgh, 1885), i, 54.

⁴ "Double hours" (so P. Jensen and H. Zimmern). Dhorme thinks that the number refers to distance: the island appeared twelve miles or leagues (?) away. This interpretation is now accepted by M. Jastrow (*Hebrew and Babylonian Traditions*, p. 332).

⁵ If Haupt and Delitsch are right, the name Nisir is derived from the same root as the Hebrew *nasar* (נָצַר), meaning "to guard, keep, preserve"; so that Mount Nisir would be "the Mount of Salvation or Deliverance." Similarly in Greek legend, Deucalion is said to have dedicated an altar to Zeus the Deliverer on the mountain where he landed after the great flood. See below, p. 264.

⁶ So P. Jensen, H. Zimmern, P. Dhorme, and A. Ungnad. "She drew near" (R. W. Rogers). "She came near" (L. W. King).

⁷ Or "incense" (so L. W. King).

to the offering, but Enlil¹ shall not come to the offering, for he took not counsel and sent the deluge, and my people he gave to destruction.' Now when Enlil¹ drew nigh, he saw the ship; then was Enlil¹ wroth. He was filled with anger against the gods, the Igigi (saying), 'Who then hath escaped with his life? No man shall live after the destruction.' Then Ninib opened his mouth and spake, he said to the warrior Enlil,¹ 'Who but Ea could have done this thing? For Ea knoweth every matter.' Then Ea opened his mouth and spake, he said to the warrior Enlil,¹ 'Thou art the governor of the gods,² O warrior, but thou wouldst not take counsel and thou hast sent the deluge! On the sinner visit his sin, and on the transgressor visit his transgression. But hold thy hand that all be not destroyed! and forbear, that all be not confounded! Instead of sending a deluge let a lion come and minish mankind! Instead of sending a deluge, let a leopard³ come and minish mankind! Instead of sending a deluge, let a famine come and waste the land! Instead of sending a deluge, let the Plague-god come and slay mankind! I did not reveal the purpose⁴ of the great gods. I caused Atrakhasis⁵ to see a dream, and thus he heard the purpose⁴ of the gods.' Thereupon Enlil⁶ arrived at a decision, and he went up into the ship. He took my hand and brought me forth, he brought my wife forth, he made her to kneel at my side, he turned towards us,⁷

¹ Or "Bel." So M. Jastrow, L. W. King, P. Jensen, and P. Dhorme. See above, p. 238, note ⁴.

² Or "Thou wise one among the gods" (so W. Muss-Arnolt, H. Zimmern, A. Jeremias, P. Dhorme, A. Ungnad, R. W. Rogers). This rendering certainly gives more point, as P. Dhorme observes, to what follows: "You so wise, yet to be so rash and unjust as to send the deluge!" The doubtful Assyrian word is *abkallu*, which, according to Delitsch, means "commander," "ruler," but according to others has the sense of "wise." See P. Jensen, *Assyrisch-Babylonische Mythen und Epen*, p. 320; P. Dhorme, *Choix de Textes religieux Assyro-Babyloniens*, p. 117.

³ The meaning of the Assyrian word (*barbaru*), here translated "leopard," is uncertain. Ungnad and Rogers render "wolf"; Jeremias prefers a panther, Jastrow a jackal, and Muss-Arnolt a tiger. The rendering "leopard" is strongly defended by P. Dhorme.

⁴ Or "secret." See above, p. 238, footnote ¹.

⁵ "The very prudent one," a name or title applied to Ut-napishtim. See below, p. 242, note ¹.

⁶ Or "Bel." So M. Jastrow, L. W. King, P. Jensen, W. Muss-Arnolt, H. Zimmern, A. Jeremias, and P. Dhorme. Ungnad and Rogers read "Ea" instead of Enlil (Bel). But the sense given by the former reading is incomparably finer. Enlil (Bel) is at first enraged at the escape of Ut-napishtim and his family, but, moved by Ea's eloquent pleading on their behalf, he experiences a revulsion of feeling, and entering the ship he magnanimously takes Ut-napishtim by the hand and leads him forth. The dramatic situation thus created is worthy of a great literary artist, and reminds us of the famous meeting of Achilles and Priam in Homer, "His hand he placed in the old man's hand, and pushed him gently away" (*Iliad*, xxiv, 508). The phrase rendered "arrived at a decision" (so L. W. King, W. Muss-Arnolt, and apparently H. Zimmern) is variously translated "came to his senses" (so A. Jeremias and formerly M. Jastrow), "then they took his counsel" (P. Jensen and P. Dhorme), and "now take counsel for him" (so A. Ungnad, R. W. Rogers, and now M. Jastrow, in *Hebrew and Babylonian Traditions*, p. 334). This last rendering ("Now take counsel for him") puts the words in the mouth of the preceding speaker Ea: so understood, they are at once feeble and otiose, whereas understood to refer to the sudden revulsion of feeling in Enlil (Bel), they are eminently in place, and add a powerful stroke to the picture.

⁷ Or "turned us face to face" (W. Muss-Arnolt), "turned us toward each other" (R. W.

he stood between us, he blessed us (saying), 'Hitherto hath Ut-napishtim been a man, but now let Ut-napishtim and his wife be like unto the gods, even us, and let Ut-napishtim dwell afar off at the mouth of the rivers!' Then they took me, and afar off, at the mouth of the rivers, they made me to dwell."

Such is the long story of the Deluge interwoven into the Gilgamesh epic, with which, to all appearance, it had originally no connexion. A fragment of another version of the tale is preserved on a broken tablet, which, like the tablets of the Gilgamesh epic, was found among the ruins of Ashurbanipal's library at Nineveh. It contains a part of the conversation which is supposed to have taken place before the flood between the god Ea and the Babylonian Noah, who is here called Atrakhasis, a name which, as we saw, is incidentally applied to him in the Gilgamesh epic, though elsewhere in that version he is named not Atrakhasis but Ut-napishtim. The name Atrakhasis is said to be the Babylonian original which in Berosus's Greek version of the Deluge legend is represented by Xisuthrus.¹ In this fragment the god Ea commands Atrakhasis, saying, "Go in and shut the door of the ship. Bring within thy corn, thy goods and thy possessions, thy (wife?), thy family, thy kinsfolk, and thy craftsmen, the cattle of the field, the beasts of the field, as many as eat grass."² In his reply the hero says that he has never built a ship before, and he begs that a plan of the ship be drawn for him on the ground, which he may follow in laying down the vessel.³

Thus far the Babylonian versions of the flood legend date only from the time of Ashurbanipal in the seventh century before our era, and might therefore conceivably be of later origin than the Hebrew version and copied from it. However, conclusive evidence of the vastly greater antiquity of the Babylonian legend is furnished by a broken tablet, which was discovered at Abu-Habbah, the site of the ancient city of Sippar, in the course of excavations undertaken by the Turkish Government. The tablet contains a very mutilated version of the flood story,

Rogers), "touched our face" (P. Dhorme), "touched our foreheads" (A. Ungnad, M. Jastrow, in *Hebrew and Babylonian Traditions*, p. 334), "touched our shoulder" (P. Jensen).

¹ Atrakhasis, "the very prudent one," in the inverted form Khasis-atra is identified with Xisuthrus by E. Schrader, H. Zimmern, P. Dhorme, and A. Ungnad. See E. Schrader, *The Cuneiform Inscriptions and the Old Testament*, i, 56; H. Zimmern, in E. Schrader's *Die Keilschriften und das Alte Testament*, Dritte Auflage, pp. 532, 551; P. Dhorme, *Choix de Textes religieux Assyro-Babyloniens*, pp. 119 note ¹⁹⁶, 132 note ⁶³; A. Ungnad, in H. Gressmann's *Altorientalische Texte und Bilder zum Alten Testamente*, i, 39 note ¹⁵, 46 note ⁴; A. Ungnad und H. Gressmann, *Das Gilgamesch-Epos*, pp. 59, 74 sq. As to the name Atrakhasis, see further P. Jensen, *Assyrisch-Babylonische Mythen und Epen*, pp. 276 sq.; H. Usener, *Die Sintflutsagen*, p. 15.

² "As many as eat grass." So P. Jensen, A. Jeremias, A. Ungnad, and R. W. Rogers. Others render simply, "all kinds of herbs," understanding the words as a direction to Atrakhasis to take on board a supply of vegetables. So P. Dhorme and M. Jastrow.

³ P. Jensen, *Assyrisch-Babylonische Mythen und Epen*, pp. 255, 257; A. Jeremias, *Das Alte Testament im Lichte des Alten Orients*,² p. 233; P. Dhorme, *Choix de Textes religieux Assyro-Babyloniens*, pp. 126 sq.; A. Ungnad, in H. Gressmann's *Altorientalische Texte und Bilder zum Alten Testamente*, i, 57; A. Ungnad und H. Gressmann, *Das Gilgamesch-Epos*, p. 69; R. W. Rogers, *Cuneiform Parallels to the Old Testament*, pp. 103 sq.; M. Jastrow, *Hebrew and Babylonian Traditions*, pp. 343-345.

and it is exactly dated; for at the end there is a colophon or note recording that the tablet was written on the twenty-eighth day of the month Shabatu (the eleventh Babylonian month) in the eleventh year of King Ammizaduga, or about 1966 B.C. Unfortunately the text is so fragmentary that little information can be extracted from it; but the name of Atrakhasis occurs in it, together with references to the great rain and apparently to the ship and the entrance into it of the people who were to be saved.¹

Yet another very ancient version of the deluge legend came to light at Nippur in the excavations conducted by the University of Pennsylvania. It is written on a small fragment of unbaked clay, and on the ground of the style of writing and of the place where the tablet was found it is dated by its discoverer, Professor H. V. Hilprecht, not later than 2100 B.C. In this fragment a god appears to announce that he will cause a deluge which will sweep away all mankind at once; and he warns the person whom he addresses to build a great ship, with a strong roof, in which he is to save his life, and also to bring the beasts of the field and the birds of heaven.²

All these versions of the flood story are written in the Semitic language of Babylonia and Assyria; but another fragmentary version, found by the American excavators at Nippur and recently deciphered, is written in Sumerian, that is, in the non-Semitic language of the ancient people who appear to have preceded the Semites in Babylonia and to have founded in the lower valley of the Euphrates that remarkable system of civilization which we commonly call Babylonian.³ The city

¹ L. W. King, *Babylonian Religion and Mythology*, pp. 124-126; P. Jensen, *Assyrisch-Babylonische Mythen und Epen*, pp. 289, 291; H. Zimmern, in E. Schrader's *Die Keilinschriften und das Alte Testament*,³ p. 552; P. Dhorme, *Choix de Textes religieux Assyro-Babyloniens*, pp. 120-125; A. Ungnad, in H. Gressmann's *Altorientalische Texte und Bilder zum Alten Testamente*, i, 57 sq.; A. Ungnad und H. Gressmann, *Das Gilgamesch-Epos*, pp. 5 sq., 69 sq.; R. W. Rogers, *Cuneiform Parallels to the Old Testament*, pp. 104-107; M. Jastrow, *Hebrew and Babylonian Traditions*, pp. 340 sq. The date of King Ammizaduga, the tenth monarch of the first Babylonian dynasty, is variously given as 2100 B.C. (so H. Zimmern) or somewhat later than 2000 B.C. (so A. Ungnad, *Das Gilgamesch-Epos*, p. 5). Professor Ed. Meyer assigns the king's reign to the years 1812-1792 B.C. (*Geschichte des Altertums*,² i, 2, p. 574); and accordingly R. W. Rogers and M. Jastrow date the king roughly at 1800 B.C. According to the latest calculation, based on elaborate astronomical data, the year of Ammizaduga's accession is now assigned by Mr. L. W. King to the year 1977 B.C., and in this dating ordinary students may provisionally acquiesce. See L. W. King, *A History of Babylon* (London, 1915), pp. 107 sqq.

² A. Ungnad und H. Gressmann, *Das Gilgamesch-Epos*, pp. 6, 73; R. W. Rogers, *Cuneiform Parallels to the Old Testament*, pp. 108 sq.; M. Jastrow, *Hebrew and Babylonian Traditions*, pp. 342 sq. These scholars incline to date the tablet later than 2100 B.C. "The tablet may well be as old as Professor Hilprecht argues, but the suggestion of a date so late as the early Kassite period (1700 B.C.) can hardly be excluded" (R. W. Rogers, *op. cit.*, p. 108).

³ The tablet containing the Sumerian version of the story was first read by Dr. Arno Poebel, of the Johns Hopkins University, in 1912. See A. Poebel, "The Babylonian Story of the Creation and the Earliest History of the World," *The Museum Journal*, Philadelphia, June, 1913, pp. 41 sqq.; *id.*, in *University of Pennsylvania, Publications of the Babylonian Section of the University Museum*, vol. iv, No. 1 (Philadelphia, 1914), pp. 7-70; M. Jastrow, *Hebrew and Babylonian Traditions*, pp. 335 sqq.; L. W. King, "Recent Babylonian Research and its Relation to Hebrew Studies," *Church Quarterly Review*, No. 162, January, 1916, pp. 271 sqq.

of Nippur, where the Sumerian version of the deluge legend has been discovered, was the holiest and perhaps the oldest religious centre in the country, and the city-god Enlil was the head of the Babylonian pantheon. The tablet which records the legend would seem, from the character of the script, to have been written about the time of the famous Hammurabi, king of Babylon, that is, about 2100 B.C. But the story itself must be very much older; for by the close of the third millennium before our era, when the tablet was inscribed, the Sumerians as a separate race had almost ceased to exist, having been absorbed in the Semitic population, and their old tongue was already a dead language, though the ancient literature and sacred texts embalmed in it were still studied and copied by the Semitic priests and scribes.¹ Hence the discovery of a Sumerian version of the deluge legend raises a presumption that the legend itself dates from a time anterior to the occupation of the Euphrates valley by the Semites, who after their immigration into the country appear to have borrowed the story from their predecessors the Sumerians. It is of interest to observe that the Sumerian version of the flood story formed a sequel to an account, unfortunately very fragmentary, of the creation of man, according to which men were created by the gods before the animals. Thus the Sumerian story agrees with the Hebrew account in Genesis, in so far as both of them treat the creation of man and the great flood as events closely connected with each other in the early history of the world; and further, the Sumerian narrative agrees with the Jehovistic against the Priestly Document in representing the creation of man as antecedent to the creation of the animals.²

Only the lower half of the tablet on which this Sumerian Genesis was inscribed has as yet come to light, but enough remains to furnish us with the main outlines of the flood story. From it we learn that Ziugiddu, or rather Ziudsuddu,³ was at once a king and a priest of the god Enki, the Sumerian deity who was the equivalent of the Semitic Ea;⁴ daily he occupied himself in the god's service, prostrating himself in humility and constant in his observance at the shrine. To reward him for his piety Enki informs him that at the request of Enlil it has been resolved in the council of the gods to destroy the seed of mankind by a rain-storm. Before the holy man receives this timely warning his divine friend bids him take his stand beside a wall, saying, "Stand by the wall on my left side, and at the wall I will speak a word with thee." These words are evidently connected with the

¹ L. W. King, "Recent Babylonian Research and its Relation to Hebrew Studies," *Church Quarterly Review*, No. 162, January, 1916, pp. 274, 275. As to the date of Hammurabi (about 2100 B.C.) see Principal J. Skinner, *Commentary on Genesis* (Edinburgh, 1910), p. xiv, note †; S. R. Driver, *The Book of Genesis*¹⁰ (London, 1916), p. 156; R. Kittel, *Geschichte des Volkes Israel*,² i (Gotha, 1912), p. 77; L. W. King, *A History of Babylon* (London, 1915), pp. 111, 320, who assigns the king's reign to 2123–2081 B.C. A later date (1958–1916 B.C.) is assigned to Hammurabi's reign by Professor Ed. Meyer (*Geschichte des Altertums*,² i, 2, p. 557).

² Genesis ii (Jehovistic) compared with Genesis i (Priestly Document).

³ So Mr. L. W. King would read the name (*Church Quarterly Review*, No. 162, January, 1916, p. 277).

⁴ L. W. King, *Babylonian Religion and Mythology*, p. 14. See above, p. 238, note †.

curious passage in the Semitic version, where Ea begins his warning to Ut-napishtim, "O reed hut, reed hut, O wall, wall, O reed hut hearken, O wall attend."¹ Together the parallel passages suggest that the friendly god, who might not directly betray the resolution of the gods to a mortal man, adopted the subterfuge of whispering it to a wall of reeds, on the other side of which he had first stationed Ziudsuddu. Thus by eavesdropping the good man learned the fatal secret, while his divine patron was able afterwards to protest that he had not revealed the counsel of the gods. The subterfuge reminds us of the well-known story, how the servant of King Midas detected the ass's ears of his master, and, unable to contain himself, whispered the secret into a hole in the ground and filled up the hole with earth; but a bed of reeds grew up on the spot, and rustling in the wind, proclaimed to all the world the king's deformity.² The part of the tablet which probably described the building of the ship and Ziudsuddu's embarkation is lost, and in the remaining portion we are plunged into the midst of the Deluge. The storms of wind and rain are described as raging together. Then the text continues: "When for seven days, for seven nights, the rain-storm had raged in the land, when the great boat had been carried away by the wind-storms on the mighty waters, the Sun-god came forth, shedding light over heaven and earth." When the light shines into the boat, Ziudsuddu prostrates himself before the Sun-god and sacrifices an ox and a sheep. Then follows a gap in the text, after which we read of Ziudsuddu, the King, prostrating himself before the gods Anu and Enlil. The anger of Enlil against men appears now to be abated, for, speaking of Ziudsuddu, he says, "Life like that of a god I give to him," and "an eternal soul like that of a god I create for him," which means that the hero of the deluge legend, the Sumerian Noah, receives the boon of immortality, if not of divinity. Further, he is given the title of "Preserver of the Seed of Mankind," and the gods cause him to dwell on a mountain, perhaps the mountain of Dilmun, though the reading of the name is uncertain. The end of the legend is wanting.

Thus in its principal features the Sumerian version of the deluge legend agrees with the much longer and more circumstantial version preserved in the Gilgamesh epic. In both a great god (Enlil or Bel) resolves to destroy mankind by flooding the earth with rain; in both another god (Enki or Ea) warns a man of the coming catastrophe, and the man, accepting the admonition, is saved in a ship; in both the flood lasts at its height for seven days; in both, when the deluge has abated, the man offers sacrifices and is finally raised to the rank of the gods. The only essential difference is in the name of the hero, who in the Sumerian version is called Ziudsuddu, and in the Semitic version Ut-napishtim or Atrakhasis. The

¹ Above, p. 238. With reference to the collocation of reeds and wall, it is well to remember that in ancient Babylonian buildings reed mats were regularly interposed between the layers of brick, at intervals of four or five feet, in order to protect the earthen mass from disintegration. So well known is this to the modern Arabs, that they give the name of *Buwariyya* or "reed mats" to ancient mounds in which this mode of construction is discernible. See W. K. Loftus, *Travels and Researches in Chaldaea and Susiana* (London, 1857), p. 168.

² Ovid, *Metamorphoses*, xi, 174 sqq.

Sumerian name Ziudsuddu resembles the name Xisuthrus, which Berosus gives as that of the hero who was saved from the flood; if the two names are really connected, we have fresh ground for admiring the fidelity with which the Babylonian historian followed the most ancient documentary sources.

The discovery of this very interesting tablet, with its combined accounts of the Creation and the Deluge, renders it highly probable that the narratives of the early history of the world which we find in Genesis did not originate with the Semites, but were borrowed by them from the older civilized people whom, some thousands of years before our era, the wild Semitic hordes, swarming out of the Arabian desert, found in possession of the fat lands of the lower Euphrates valley, and from whom the descendants of these primitive Bedouins gradually learned the arts and habits of civilization, just as the northern barbarians acquired a varnish of culture through their settlement in the Roman empire.

The various fragmentary versions, Babylonian and Sumerian, of the deluge story confirm the conclusion that the legend circulated independently of the Gilgamesh epic, into which the poet loosely inserted it as an episode. In the epic the original scene of the disaster is laid, as we saw, at the city of Shurippak on the Euphrates. Recent excavations of the German Oriental Society have revealed the site of the ancient city. The place is at the hill of Fara, to the north of Uruk, and the remains which have come to light there seem to show that Shurippak was among the very oldest Sumerian settlements yet discovered; for the inscribed clay tablets which have been excavated on the spot are of a very archaic character, and are believed to have been written not much later than 3400 B.C.¹ The site is now a long way from the sea and at some distance from the Euphrates; but we know that in the course of ages the river has repeatedly changed its bed, and that the sea has retreated, or rather that the land has advanced, in consequence of the vast quantities of soil annually washed down by the Euphrates and the Tigris.² Apparently the ancient city perished, not by water, but by fire; for the ruins are buried under a thick layer of ashes. After the conflagration the greater part of the hill seems to have remained desolate, though a small town existed on the spot during the Sumerian and Accadian periods. From about the time of Hammurabi, that is, from about 2100 B.C. onward, the very name of Shurippak vanishes from Babylonian history.³ Thus the story of the great flood which destroyed the city cannot have originated later than the end of the third millennium before Christ, and it may well have been very much older. In the Sumerian version of the deluge legend Shurippak is named, along with Eridu, Larak, and Sippar, as cities before the flood; but in the fragmentary state of the

¹ A. Ungnad und H. Gressmann, *Das Gilgamesch-Epos*, pp. 190 sq.

² T. H. Huxley, "Hasisadra's Adventure," *Collected Essays*, vol. iv (London, 1911), pp. 250 sq.; Eduard Suess, *The Face of the Earth*, i (Oxford, 1904), pp. 24 sq.; G. Maspero, *Histoire Ancienne des peuples de l'Orient Classique, Les Origines* (Paris, 1895), pp. 552 sq.; Ed. Meyer, *Geschichte des Altertums*,² i, 2 (Stuttgart und Berlin, 1909), pp. 398 sq.

³ A. Ungnad und H. Gressmann, *Das Gilgamesch-Epos*, p. 191.

text it is impossible to say whether or not it was the city of Ziudsuddu, the Sumerian Noah.¹

§3. THE HEBREW STORY OF A GREAT FLOOD.

The ancient Hebrew legend of a great flood, as it is recorded in the book of Genesis,² runs thus:—

“And the Lord saw that the wickedness of man was great in the earth, and that every imagination of the thoughts of his heart was only evil continually. And it repented the Lord that he had made man on the earth, and it grieved him at his heart. And the Lord said, I will destroy man whom I have created from the face of the ground; both man and beast, and creeping thing, and fowl of the air; for it repenteth me that I have made them. But Noah found grace in the eyes of the Lord.

“These are the generations of Noah. Noah was a righteous man and perfect in his generations. Noah walked with God. And Noah begat three sons, Shem, Ham, and Japheth. And the earth was corrupt before God, and the earth was filled with violence. And God saw the earth, and behold, it was corrupt; for all flesh had corrupted his way upon the earth. And God said unto Noah, The end of all flesh is come before me; for the earth is filled with violence through them; and, behold, I will destroy them with the earth. Make thee an ark of gopher wood; rooms shalt thou make in the ark, and shalt pitch it within and without with pitch. And this is how thou shalt make it: the length of the ark three hundred cubits, the breadth of it fifty cubits, and the height of it thirty cubits. A light shalt thou make to the ark, and to a cubit shalt thou finish it upward; and the door of the ark shalt thou set in the side thereof; with lower, second, and third stories shalt thou make it. And I, behold, I do bring the flood of waters upon the earth, to destroy all flesh, wherein is the breath of life, from under heaven, every thing that is in the earth shall die. But I will establish my covenant with thee; and thou shalt come into the ark, thou, and thy sons, and thy wife, and thy sons' wives with thee. And of every living thing of all flesh, two of every sort shalt thou bring into the ark, to keep them alive with thee; they shall be male and female. Of the fowl after their kind, and of the cattle after their kind, of every creeping thing of the ground after its kind, two of every sort shall come unto thee, to keep them alive. And take thou unto thee of all food that is eaten, and gather it to thee; and it shall be for food for thee, and for them. Thus did Noah; according to all that God commanded him, so did he.

“And the Lord said unto Noah, Come thou and all thy house into the ark; for thee have I seen righteous before me in this generation. Of every clean beast thou shalt take to thee seven and seven, the male and his female; and of the beasts that are not clean two, the male and his female; of the fowl also of the air, seven and seven, male

¹ A. Poebel, in *The University of Pennsylvania, Publications of the Babylonian Section of the University Museum*, vol. iv, No. 1 (Philadelphia, 1914), pp. 18, 44.

² Genesis vi, 5–ix, 17, Revised Version.

and female : *to keep seed alive upon the face of all the earth. For yet seven days, and I will cause it to rain upon the earth forty days and forty nights ; and every living thing that I have made will I destroy from off the face of the ground. And Noah did according unto all that the Lord commanded him. And Noah was six hundred years old when the flood of waters was upon the earth. And Noah went in, and his sons, and his wife, and his sons' wives with him, into the ark, because of the waters of the flood. Of clean beasts, and of beasts that are not clean, and of fowls, and of every thing that creepeth upon the ground, there went in two and two unto Noah into the ark, male and female, as God commanded Noah. And it came to pass after the seven days, that the waters of the flood were upon the earth. In the six hundredth year of Noah's life, in the second month, on the seventeenth day of the month, on the same day were all the fountains of the great deep broken up, and the windows of heaven were opened. And the rain was upon the earth forty days and forty nights.*

“ In the selfsame day entered Noah, and Shem, and Ham, and Japheth, the sons of Noah, and Noah's wife, and the three wives of his sons with them, into the ark ; they, and every beast after its kind, and all the cattle after their kind, and every creeping thing that creepeth upon the earth after its kind, and every fowl after its kind, every bird of every sort. And they went in unto Noah into the ark, two and two of all flesh, wherein is the breath of life. And they that went in, went in male and female of all flesh, as God commanded him : *and the Lord shut him in. And the flood was forty days upon the earth ; and the waters increased, and bare up the ark, and it was lift up above the earth. And the waters prevailed, and increased greatly upon the earth ; and the ark went upon the face of the waters. And the waters prevailed exceedingly upon the earth ; and all the high mountains that were under the whole heaven were covered. Fifteen cubits upward did the waters prevail ; and the mountains were covered. And all flesh died that moved upon the earth, both fowl, and cattle, and beast, and every creeping thing that creepeth upon the earth, and every man : all in whose nostrils was the breath of the spirit of life, of all that was in the dry land, died. And every living thing was destroyed which was upon the face of the ground, both man, and cattle, and creeping thing, and fowl of the heaven ; and they were destroyed from the earth : and Noah only was left, and they that were with him in the ark. And the waters prevailed upon the earth an hundred and fifty days.*

“ And God remembered Noah, and every living thing, and all the cattle that were with him in the ark : and God made a wind to pass over the earth, and the waters assuaged ; the fountains also of the deep and the windows of heaven were stopped, *and the rain from heaven was restrained ; and the waters returned from off the earth continually : and after the end of an hundred and fifty days the waters decreased. And the ark rested in the seventh month, on the seventeenth day of the month, upon the mountains of Ararat. And the waters decreased continually until the tenth month : in the tenth month, on the first day of the month, were the tops of the mountains seen. And it came to pass at the end of forty days, that*

Noah opened the window of the ark which he had made: and he sent forth a raven, and it went forth to and fro, until the waters were dried up from off the earth. And he sent forth a dove from him, to see if the waters were abated from off the face of the ground; but the dove found no rest for the sole of her foot, and she returned unto him to the ark, for the waters were on the face of the whole earth: and he put forth his hand, and took her, and brought her in unto him into the ark. And he stayed yet other seven days; and again he sent forth the dove out of the ark; and the dove came into him at eventide; and, lo, in her mouth an olive leaf pluckt off: so Noah knew that the waters were abated from off the earth. And he stayed yet other seven days; and sent forth the dove; and she returned not again unto him any more. And it came to pass in the six hundred and first year, in the first month, the first day of the month, the waters were dried up from off the earth: and Noah removed the covering of the ark, and looked, and, behold, the face of the ground was dried. And in the second month, on the seven and twentieth day of the month, was the earth dry.

“And God spake unto Noah, saying, Go forth of the ark, thou, and thy wife, and thy sons, and thy sons’ wives with thee. Bring forth with thee every living thing that is with thee of all flesh, both fowl, and cattle, and every creeping thing that creepeth upon the earth; that they may breed abundantly in the earth, and be fruitful, and multiply upon the earth. And Noah went forth, and his sons, and his wife, and his sons’ wives with him: every beast, every creeping thing, and every fowl, whatsoever moveth upon the earth, after their families, went forth out of the ark. And Noah builded an altar unto the Lord; and took of every clean beast, and of every clean fowl, and offered burnt offerings on the altar. And the Lord smelled the sweet savour; and the Lord said in his heart, *I will not again curse the ground any more for man’s sake, for that the imagination of man’s heart is evil from his youth; neither will I again smite any more every thing living, as I have done. While the earth remaineth, seedtime and harvest, and cold and heat, and summer and winter, and day and night shall not cease.*

“And God blessed Noah and his sons, and said unto them, Be fruitful, and multiply, and replenish the earth. And the fear of you and the dread of you shall be upon every beast of the earth, and upon every fowl of the air; with all where-with the ground teemeth, and all the fishes of the sea, into your hand are they delivered. Every moving thing that liveth shall be food for you; as the green herb have I given you all. But flesh with the life thereof, which is the blood thereof, shall ye not eat. And surely your blood, the blood of your lives, will I require; at the hand of every beast will I require it: and at the hand of man, even at the hand of every man’s brother, will I require the life of man. Whoso sheddeth man’s blood, by man shall his blood be shed: for in the image of God made he man. And you, be ye fruitful, and multiply; bring forth abundantly in the earth, and multiply therein.

“And God spake unto Noah, and to his sons with him, saying, And I, behold, I establish my covenant with you, and with your seed after you; and with every

living creature that is with you, the fowl, the cattle, and every beast of the earth with you; of all that go out of the ark, even every beast of the earth. And I will establish my covenant with you; neither shall all flesh be cut off any more by the waters of the flood; neither shall there any more be a flood to destroy the earth. And God said, This is the token of the covenant which I make between me and you and every living creature that is with you, for perpetual generations: I do set my bow in the cloud, and it shall be for a token of a covenant between me and the earth. And it shall come to pass, when I bring a cloud over the earth, that the bow shall be seen in the cloud, and I will remember my covenant, which is between me and you and every living creature of all flesh; and the waters shall no more become a flood to destroy all flesh. And the bow shall be in the cloud; and I will look upon it, that I may remember the everlasting covenant between God and every living creature of all flesh that is upon the earth. And God said unto Noah, This is the token of the covenant which I have established between me and all flesh that is on the earth."

In this account of the Deluge Biblical critics are now agreed in detecting the presence of two originally distinct and to some extent inconsistent narratives, which have been combined so as to present the superficial appearance of a single homogeneous story. Yet the editorial task of uniting them has been performed so clumsily that the repetitions and inconsistencies left standing in them can hardly fail to attract the attention even of a careless reader. In reproducing the text of the legend from the English Revised Version I have distinguished the two strands of the composite narrative by printing them in different types; the analysis thus exhibited is the one now generally accepted by critics.¹

Of the two versions of the legend thus artificially combined, the one, printed in ordinary Roman type, is derived from what the critics call the Priestly Code (usually designated by the letter P); the other, printed in italic type, is derived from what the critics call the Jehovistic or Jahwistic document (usually designated by the letter J), which is characterized by the use of the divine name Jehovah (Jahweh, or, rather, Yahweh). The two documents differ conspicuously in character and style, and they belong to different ages; for while the Jehovistic narrative is probably the oldest, the Priestly Code is now generally admitted to be the latest, of the four principal documents which have been united to form the Hexateuch. The Jehovistic document is believed to have been written in Judea in the early

¹ W. Robertson Smith, *The Old Testament in the Jewish Church*² (London and Edinburgh, 1892), pp. 329 sq.; E. Kautsch und A. Socin, *Die Genesis, mit äusserer Unterscheidung der Quellschriften*² (Freiburg i. B., 1891), pp. 11 sqq.; E. Kautsch, *Die heilige Schrift des Alten Testaments übersetzt und herausgegeben* (Freiburg i. B. und Leipzig, 1894), pp. 6 sqq.; J. Estlin Carpenter and G. Harford-Battersby, *The Hexateuch* (London, 1900), ii, 9 sqq.; W. H. Bennett, *Genesis*, pp. 135 sqq. (*The Century Bible*); W. H. Bennett and W. F. Adeney, *A Biblical Introduction*⁶ (London, 1908), pp. 27 sqq.; S. R. Driver, *The Book of Genesis*¹⁰ (London, 1916), pp. 85 sqq.; *id.*, *Introduction to the Literature of the Old Testament*⁹ (Edinburgh, 1913), p. 14; K. Budde, *Geschichte des althebräischen Litteratur* (Leipzig, 1906), pp. 47 sqq.; J. Skinner, *Critical and Exegetical Commentary on Genesis* (Edinburgh, 1910), pp. 147 sqq.; M. Jastrow, *Hebrew and Babylonian Traditions* (London, 1914), pp. 348 sqq.

times of the Hebrew monarchy, probably in the ninth or eighth century before our era; the Priestly Code dates from the period after the year 586 B.C., when Jerusalem was taken by Nebuchadnezzar, King of Babylon, and the Jews were carried away by him into captivity. Both documents are in their form historical, but while the Jehovistic writer displays a genuine interest in the characters and adventures of the men and women whom he describes, the Priestly writer appears to concern himself with them only so far as he deemed them instruments in the great scheme of Providence for conveying to Israel a knowledge of God and of the religious and social institutions by which it was his gracious will that the Chosen People should regulate their lives. The history which he writes is sacred and ecclesiastical rather than secular and civil; his preoccupation is with Israel as a Church rather than as a nation. Hence, while he dwells at comparative length on the lives of the patriarchs and prophets to whom the deity deigned to reveal himself, he hurries over whole generations of common mortals, whom he barely mentions by name, as if they were mere links to connect one religious epoch with another, mere packthread on which to string at rare intervals the splendid jewels of revelation. His attitude to the past is sufficiently explained by the circumstances of the times in which he lived. The great age of Israel was over; its independence was gone, and with it the hopes of worldly prosperity and glory. The rosy dreams of empire, which the splendid reigns of David and Solomon had conjured up in the hearts of the people, and which may have lingered for a while, like morning clouds, even after the disruption of the monarchy, had long ago faded in the clouded evening of the nation's day, under the grim reality of foreign domination. Barred from all the roads of purely mundane ambition, the irrepressible idealism of the national temperament now found a vent for itself in another direction. Its dreams took a different cast. If earth was shut upon it, heaven was still open; and, like Jacob at Bethel, with enemies behind him and before, the dreamer beheld a ladder stretching up beyond the clouds, by which angelic hosts might descend to guard and comfort the forlorn pilgrim. In short, the leaders of Israel sought to console and compensate their nation for the humiliations she had to endure in the secular sphere by raising her to a position of supremacy in the spiritual. For this purpose they constructed or perfected an elaborate system of religious ritual designed to forestall and engross the divine favour, and so to make Zion the holy city, the joy and centre of God's kingdom on earth. With these aims and ambitions the tone of public life became more and more clerical, its interests ecclesiastical, its predominant influence priestly. The king was replaced by the high priest, who succeeded even to the purple robes and golden crown of his predecessor.¹ The revolution which thus substituted a line of pontiffs for a line of temporal rulers at Jerusalem was like that which converted the Rome of the Cæsars into the Rome of the mediæval Popes.

It is this movement of thought, this current of religious aspirations setting strongly in the direction of ecclesiasticism, which is reflected—we may almost say

¹ W. Robertson Smith, *The Old Testament in the Jewish Church*,² p. 445.

arrested and crystallized—in the Priestly Code. The intellectual and moral limitations of the movement are mirrored in the corresponding limitations of the writer. It is the formal side of religion in which alone he is really interested; it is in the details of rites and ceremonies, of ecclesiastical furniture and garments, that he revels with genuine gusto. The deeper side of religion is practically a sealed book for him: its moral and spiritual aspects he barely glances at: into the profound problems of immortality and the origin of evil, which have agitated inquiring spirits in all the ages, he never enters. With his absorption in the minutiae of ritual, his indifference to purely secular affairs, his predilection for chronology and genealogy, for dates and figures—in a word, for the dry bones rather than the flesh and blood of history—the priestly historian is like one of those monkish chroniclers of the Middle Ages who looked out on the great world through the narrow loophole of a cloistered cell or the many-tinted glass of a cathedral window. His intellectual horizon was narrowed, the atmosphere in which he beheld events was coloured, by the medium through which he saw them. Thus the splendours of the Tabernacle in the wilderness, invisible to all eyes but his, are as if they had loomed on his heated imagination through the purple lights of a rose-window or the gorgeous panes of some flamboyant oriel. Even in the slow processes or sudden catastrophes which have fashioned or transformed the material universe he discerned little more than the signs and wonders vouchsafed by the deity to herald new epochs of religious dispensation. For him the work of Creation was a grand prelude to the institution of the sabbath.¹ The vault of heaven itself, spangled with glorious luminaries, was a magnificent dial-plate on which the finger of God pointed eternally to the correct seasons of the feasts in the ecclesiastical calendar.² The Deluge, which swept away almost the whole of mankind, was the occasion which the repentant deity took to establish a covenant with the miserable survivors; and the rainbow, glowing in iridescent radiance against the murky storm-cloud, was nothing but the divine seal appended to the covenant as a guarantee of its genuine and irrevocable character.³ For the priestly historian was a lawyer as well as an ecclesiastic, and as such he took great pains to prove that the friendly relations of God to his people rested on a strictly legal basis, being authenticated by a series of contracts into which both parties entered with all due formality. He is never so much in his element as when he is expounding these covenants; he never wearies of recalling the long series of Israel's title-deeds. Nowhere does this dryasdust antiquary, this rigid ritualist, so sensibly relax his normal severity, nowhere does he so nearly unbend and thaw, as when he is expatiating on the congenial subject of contracts and conveyances. His masterpiece of historical narrative is acknow-

¹ Genesis ii, 1 *sq.*

² Genesis i, 14. The Hebrew word here translated "seasons" (מִזְמֹרִים) "appears never (certainly not in P) to be used of the natural seasons of the year, but always of a time conventionally agreed upon, or fixed by some circumstance. The commonest application is to the *sacred seasons* of the ecclesiastical year, which are fixed by the moon" (Principal J. Skinner, in his *Critical and Exegetical Commentary on Genesis*, p. 26).

³ Genesis ix, 8–17.

ledged to be his account of the negotiations into which the widowed Abraham entered with the sons of Heth in order to obtain a family vault in which to bury his wife.¹ The lugubrious nature of the transaction does not damp the professional zest of the narrator; and the picture he has drawn of it combines the touches of no mean artist with the minute exactitude of a practised conveyancer. At this distance of time the whole scene still passes before us, as similar scenes may have passed before the eyes of the writer, and as they may still be witnessed in the East, when two well-bred Arab sheikhs fence dexterously over a point of business, while they observe punctiliously the stately forms and courtesies of Oriental diplomacy. But such pictures are rare indeed in this artist's gallery. Landscapes he hardly attempted, and his portraits are daubs, lacking all individuality, life, and colour. In that of Moses, which he laboured most, the great leader is little more than a lay figure rigged out to distribute ecclesiastical upholstery and millinery.²

Very different are the pictures of the patriarchal age bequeathed to us by the author of the Jehovistic document. In purity of outline, lightness and delicacy of touch, and warmth of colouring, they are unsurpassed, perhaps unequalled, in literature. The finest effects are produced by the fewest strokes, because every stroke is that of a master who knows instinctively just what to put in and what to leave out. Thus, while his whole attention seems to be given to the human figures in the foreground, who stand out from the canvas with lifelike truth and solidity, he contrives simultaneously, with a few deft, almost imperceptible touches, to indicate the landscape behind them, and so to complete a harmonious picture which stamps itself indelibly on the memory. The scene, for example, of Jacob and Rachel at the well, with the flocks of sheep lying round it in the noontide heat, is as vivid in the writer's words as it is in the colours of Raphael.

And to this exquisite picturesqueness in the delineation of human life he adds a charming naïvety, an antique simplicity, in his descriptions of the divine. He carries us back to the days of old, when no such awful gulf was supposed to yawn between man and the deity. In his pages we read how God moulded the first man out of clay, as a child shapes its mud baby³; how he walked in the garden in the cool of the evening and called to the shamefaced couple who had been hiding behind trees⁴; how he made coats of skin to replace the too scanty fig-leaves of our first parents⁵; how he shut the door behind Noah, when the patriarch had entered into the ark⁶; how he sniffed the sweet savour of the burning sacrifice⁷; how he came down to look at the tower of Babel,⁸ apparently because, viewed from the sky, it was beyond his reach of vision; how he conversed with Abraham at the door of his tent, in the heat of the day, under the shadow of the whispering oaks.⁹

¹ Genesis xxiii.

² W. Robertson Smith, *The Old Testament in the Jewish Church*,² p. 409.

³ Genesis ii, 7.

⁴ Genesis iii, 8 *sq.*

⁵ Genesis iii, 21.

⁶ Genesis vii, 16.

⁷ Genesis viii, 21.

⁸ Genesis xi, 5 and 7.

⁹ Genesis xviii, 1 *sqq.* In the English Authorized Version the trees have disappeared from the picture and been replaced by plains. They are rightly restored in the Revised

In short, the whole work of this delightful writer is instinct with a breath of poetry, with something of the freshness and fragrance of the olden time, which invests it with an ineffable and immortal charm.¹

In the composite narrative of the Great Flood which we possess in Genesis, the separate ingredients contributed by the Jehovistic and the Priestly documents respectively are distinguishable from each other both by verbal and by material differences. To take the verbal differences first, the most striking is that in the Hebrew original the deity is uniformly designated, in the Jehovistic document by the name of *Jehovah* (*Jahveh*), and in the Priestly document by the name of *Elohim*, which in the English version are rendered respectively by the words "Lord" and "God." In representing the Hebrew *Jehovah* (*Jahveh*) by "Lord," the English translators follow the practice of the Jews, who, in reading the Scriptures aloud, uniformly substitute the title *Adonai* or "Lord" for the sacred name of Jehovah, wherever they find the latter written in the text. Hence the English reader may assume as a general rule that in the passages of the English version, where the title "Lord" is applied to the deity, the name Jehovah stands for it in the written or printed Hebrew text.² But in the narrative of the Flood

Version, though the correct rendering of the Hebrew word is perhaps rather "terebinths" than "oaks."

¹ As to the two documents, the Jehovistic (J) and the Priestly (P), see W. Robertson Smith, *The Old Testament in the Jewish Church*,² pp. 319 sqq., 381 sqq., 442 sqq.; J. Estlin Carpenter and G. Harford-Battersby, *The Hexateuch*, i, 33 sqq., 97 sqq., 121 sqq.; E. Kautsch, *Die heilige Schrift des Alten Testaments* (Freiburg i. B. und Leipzig, 1894), ii, 150 sqq., 188 sqq.; W. H. Bennett, *Genesis*, pp. 9 sqq., 22 sqq., 34 sqq.; W. H. Bennett and W. F. Adeney, *A Biblical Introduction*,⁵ pp. 20 sqq.; S. R. Driver, *Introduction to the Literature of the Old Testament*,⁹ pp. 10 sqq., 116 sqq.; *id.*, *The Book of Genesis*,¹⁰ Introduction, pp. iv sqq.; K. Budde, *Geschichte der altthebräischen Litteratur*, pp. 45–65, 183–205; J. Skinner, *Critical and Exegetical Commentary on Genesis*, pp. xxxii–lxvii; H. Gunkel, *Genesis übersetzt und erklärt*³ (Göttingen, 1910), pp. lxxx sqq., xcii sqq.; R. Kittel, *Geschichte des Volkes Israel*² (Gotha, 1909–1912), i, 273–333, ii, 398 sqq. Critics seem generally to agree that the Priestly Code is the framework into which the three other main constituents of the Hexateuch have been fitted, and that it was substantially "the book of the law of Moses," which was publicly promulgated by Ezra at Jerusalem in 444 B.C. and accepted by the people as the basis of a new reformation (Nehemiah viii). But the work of combining the Priestly Code with the other documents, so as to form our present Hexateuch, appears to have been carried out at a later date, perhaps about 400 B.C. See J. Estlin Carpenter and G. Harford-Battersby, *The Hexateuch*, i, 176 sqq.; W. H. Bennett and F. W. Adeney, *op. cit.*, pp. 56 sqq. Besides the Priestly Code (P) and the Jehovistic document (J), the two main constituents of the Hexateuch are Deuteronomy (the D of the critics) and the Elohist document (the E of the critics). Of these, the Elohist is the older; it is generally believed to have been composed in northern Israel not very long after the Jehovistic document, perhaps early in the eighth century B.C. In style and character it is akin to the Jehovistic document, but the writer is not so great a literary artist, though his religious and moral standpoint is somewhat more advanced. Unlike the Jehovistic writer, he uses the divine name *Elohim* for God instead of Jehovah. It is generally believed that the main part of Deuteronomy is "the book of the law" which was found in the temple at Jerusalem in 621 B.C. and formed the basis of Josiah's reformation (II Kings xxii, 8 sqq.). On these matters the reader will find the evidence stated and discussed in the works mentioned at the beginning of this note.

² See E. Kautsch, in *Encyclopædia Biblica*, ii, 3320 sqq., s.v. "Names

and throughout Genesis the Priestly writer avoids the use of the name Jehovah and substitutes for it the term *Elohim*, which is the ordinary Hebrew word for God; and his reason for doing so is that according to him the divine name Jehovah was first revealed by God to Moses,¹ and therefore could not have been applied to him in the earlier ages of the world. On the other hand, the Jehovistic writer has no such theory as to the revelation of the name Jehovah; hence he bestows it on the deity without scruple from the Creation onwards.

Apart from this capital distinction between the documents, there are verbal differences which do not appear in the English translation. Thus, one set of words is used for "male and female" in the Jehovistic document, and quite a different set in the Priestly.² Again, the words translated "destroy" in the English version are different in the two documents,³ and similarly with the words which the English translators represent by "die"⁴ and "died."⁵

But the material differences between the Jehovistic and the Priestly narratives are still more remarkable, and as they amount in some cases to positive contradictions, the proof that they emanate from separate documents may be regarded as complete. Thus in the Jehovistic narrative the clean animals are distinguished from the unclean, and while seven pairs of every sort of clean animals are admitted to the ark, only one pair of each sort of unclean animals is suffered to enter.⁶ On the other hand, the Priestly writer makes no such invidious distinction between the animals, but admits them to the ark on a footing of perfect equality, though at the same time he impartially limits them all alike to a single couple of each sort.⁷ The explanation of this discrepancy is that in the view of the Priestly writer the distinction between clean and unclean animals was first revealed by God to Moses,⁸ and could not therefore have been known to his predecessor Noah; whereas the Jehovistic writer, untroubled by any such theory, naively assumes the distinction between clean and unclean animals to have been familiar to mankind from the earliest times, as if it rested on a natural difference too obvious to be overlooked by anybody.

Another serious discrepancy between the two writers relates to the duration of the Flood. In the Jehovistic narrative the rain lasted forty days and forty nights,⁹ and afterwards Noah passed three weeks in the ark before the water had

¹ Exodus vi, 2 sq.

² אִישׁ וְאִשְׁתּוֹ in J (vii, 2), זָכָר וּנְקֵבָה in P (vi, 19, vii, 9, 16).

³ מָחָה in J (vi, 7, vii, 4, 23), מָחָה in P (vi, 13, 17, ix, 11, 15). The former word means properly "blot out," as it is rendered in the margin of the English Revised Version; the latter is the ordinary Hebrew word for "destroy."

⁴ מוֹת in J (vii, 22), נָתַן in P (vi, 17, vii, 21). The former is the ordinary Hebrew word or "die"; the latter is sometimes translated "give up the ghost."

⁵ הָיָה in J (viii, 13), גָּשׁ in P (viii, 14). All the foregoing and other verbal differences between the two documents are noted by Principal J. Skinner in his *Critical and Exegetical Commentary on Genesis*, p. 148. Compare H. Gunkel, *Genesis übersetzt und erklärt*³ (Göttingen, 1910), p. 138.

⁶ Genesis vii, 2, compare viii, 20.

⁷ Genesis vi, 19 sq., vii, 15 sq.

⁸ Leviticus xi; Deuteronomy xiv, 4-20.

⁹ Genesis vii, 12, 17.

subsided enough to let him land.¹ On this reckoning the Flood lasted sixty-one days. On the other hand, in the Priestly narrative it was a hundred and fifty days before the water began to sink,² and the Flood lasted altogether for twelve months and eleven days.³ As the Hebrew months were lunar, twelve of them would amount to three hundred and fifty-four days, and eleven days added to them would give a solar year of three hundred and sixty-five days.⁴ Since the Priestly writer thus assigns to the duration of the Flood the precise length of a solar year, we may safely assume that he lived at a time when the Jews were able to correct the serious error of the lunar calendar by observation of the sun.

Again, the two writers differ from each other in the causes which they allege for the Flood; for whereas the Jehovistic writer puts it down to rain only,⁵ the Priestly writer speaks of subterranean waters bursting forth as well as of sheets of water descending from heaven.⁶

Lastly, the Jehovistic writer represents Noah as building an altar and sacrificing to God in gratitude for his escape from the Flood.⁷ The Priestly writer, on the other hand, makes no mention either of the altar or of the sacrifice; no doubt because from the standpoint of the Levitical law, which he occupied, there could be no legitimate altar anywhere but in the temple at Jerusalem, and because for a mere layman like Noah to offer a sacrifice would have been an unheard-of impropriety, a gross encroachment on the rights of the clergy which he could not for a moment dream of imputing to the respectable patriarch.

Thus a comparison of the Jehovistic and the Priestly narratives strongly confirms the conclusion of the critics that the two were originally independent, and that the Jehovistic is considerably the older. For the Jehovistic writer is clearly ignorant of the law of the one sanctuary, which forbade the offering of sacrifice anywhere but at Jerusalem; and as that law was first clearly enunciated and enforced by King Josiah in 621 B.C., it follows that the Jehovistic document must have been composed some time, probably a long time, before that date. For a like reason the Priestly document must have been composed some time, probably a long time, after that date, since the writer implicitly recognizes the law of the one sanctuary by refusing to impute a breach of it to Noah. Thus, whereas the Jehovistic writer betrays a certain archaic simplicity in artlessly attributing to the earliest ages of the world the religious institutions and phraseology of his own time, the Priestly writer reveals the reflection of a later age, which has worked out a definite theory of religious evolution and applies it rigidly to history.

A very cursory comparison of the Hebrew with the Babylonian account of the Deluge may suffice to convince that the two narratives are not independent, but that one of them must be derived from the other, or both from a common original.

¹ Genesis viii, 6-13.

² Genesis viii, 3.

³ Genesis vii, 11, compared with viii, 14.

⁴ S. R. Driver, *The Book of Genesis*,¹⁰ p. 85; J. Skinner, *Critical and Exegetical Commentary on Genesis*, pp. 167 sqq.; H. Gunkel, *Genesis übersetzt und erklärt*,³ pp. 146 sq.

⁵ Genesis vii, 12.

⁶ Genesis vii, 11, compare viii, 2.

⁷ Genesis viii, 20 sq.

The points of resemblance between the two are far too numerous and detailed to be accidental. In both narratives the divine powers resolve to destroy mankind by a great flood; in both the secret is revealed beforehand to a man by a god, who directs him to build a great vessel, in which to save himself and seed of every kind. It is probably no mere accidental coincidence that in the Babylonian story, as reported by Berosus, the hero saved from the Flood was the *tenth* King of Babylon, and that in the Hebrew story Noah was the *tenth* man in descent from Adam. In both narratives the favoured man, thus warned of God, builds a huge vessel in several stories, makes it water-tight with pitch or bitumen, and takes into it his family and animals of all sorts: in both, the Deluge is brought about in large measure by heavy rain, and lasts for a greater or less number of days: in both, all mankind are drowned except the hero and his family: in both, the man sends forth birds, a raven and a dove, to see whether the water of the Flood has abated: in both, the dove after a time returns to the ship because it could find no place in which to rest: in both, the raven does not return: in both, the vessel at last grounds on a mountain: in both, the hero, in gratitude for his rescue, offers sacrifice on the mountain: in both, the gods smell the sweet savour, and their anger is appeased.

So much for the general resemblance between the Babylonian narrative as a whole, and the Hebrew narrative as a whole. But if we take into account the separate elements of the Hebrew narrative we shall see that the Jehovistic narrative is in closer agreement than the Priestly with the Babylonian. Alike in the Jehovistic and in the Babylonian narrative special prominence is given to the number seven. In the Jehovistic version, Noah has a seven days' warning of the coming Deluge: he takes seven pairs of every sort of clean animals with him into the ark: he allows intervals of seven days to elapse between the successive despatches of the dove from the ark. In the Babylonian version the Flood lasts at its greatest height for seven days; and the hero sets out the sacrificial vessels by sevens on the mountain. Again, alike in the Jehovistic and the Babylonian version, special mention is made of shutting the door of the ship or ark when the man, his family, and the animals have entered into it; in both alike we have the picturesque episode of sending forth the raven and the dove from the vessel, and in both alike the offering of the sacrifice, the smelling of it by the gods, and their consequent appeasement. On the other hand, in certain particulars the Priestly narrative in Genesis approaches more closely than the Jehovistic to the Babylonian. Thus, in both the Priestly and the Babylonian version exact directions are given for the construction of the vessel: in both alike it is built in several stories, each of which is divided into numerous cabins: in both alike it is made watertight by being caulked with pitch or bitumen: in both alike it grounds on a mountain; and in both alike, on issuing from the vessel, the hero receives the divine blessing.

But if the Hebrew and Babylonian narratives are closely related to each other, how is the relation to be explained? The Babylonian cannot be derived from the Hebrew, since it is older than the Hebrew by at least eleven or twelve centuries.

Moreover, "as Zimmern has remarked, the very essence of the Biblical narrative presupposes a country liable, like Babylonia, to inundations; so that it cannot be doubted that the story was 'indigenous in Babylonia, and transplanted to Palestine.'"¹ But if the Hebrews derived the story of the Great Flood from Babylonia, when and how did they do so? We have no information on the subject, and the question can only be answered conjecturally. Some scholars of repute have supposed that the Jews first learned the legend in Babylon during the captivity, and that the Biblical narrative is consequently not older than the sixth century before our era.² This view might be tenable if we only possessed the Hebrew version of the deluge legend in the Priestly recension; for the Priestly Code, as we saw, was probably composed during or after the captivity, and it is perfectly possible that the writers of it acquired a knowledge of the Babylonian tradition either orally or from Babylonian literature during their exile or perhaps after their return to Palestine; for it is reasonable to suppose that the intimate relations which the conquest established between the two countries may have led to a certain diffusion of Babylonian literature in Palestine, and of Jewish literature in Babylonia. On this view some of the points in which the Priestly narrative departs from the Jehovistic and approximates to the Babylonian may conceivably have been borrowed directly by the Priestly writers from Babylonian sources. Such points are the details as to the construction of the ark, and in particular the smearing of it with pitch or bitumen, which is a characteristic product of Babylonia.³ But that the Hebrews were acquainted with the story of the Great Flood, and that too in a form closely akin to the Babylonian, long before they were carried away into captivity, is abundantly proved by the Jehovistic narrative in Genesis, which may well date from the ninth century before our era and can hardly be later than the eighth.

Assuming, then, that the Hebrews in Palestine were familiar from an early time with the Babylonian legend of the Deluge, we have still to ask, how and when did they learn it? Two answers to the question have been given. On the one hand, it has been held that the Hebrews may have brought the legend with them, when they migrated from Babylonia to Palestine about two thousand years before Christ.⁴ On the other hand, it has been suggested that, after their settlement in Palestine, the Hebrews may have borrowed the story from the native Canaanites, who in their turn may have learned it through the medium of Babylonian literature some time in

¹ S. R. Driver, *The Book of Genesis*¹⁰, p. 107.

² This is, or was, the opinion of P. Haupt and Fr. Delitsch, as reported by E. Schrader, *The Cuneiform Inscriptions and the Old Testament*, i, 55. The view is rightly rejected by Schrader.

³ Herodotus, i, 179, with the note in George Rawlinson's translation (Fourth Edition, vol. i, London, 1880, p. 300).

⁴ This is the view of Professor M. Jastrow (*Hebrew and Babylonian Traditions*, pp. 13 *sqq.*), who identifies Abraham's contemporary, Amraphel, King of Shinar (Genesis xiv, 1), with Hammurabi, King of Babylon, thus dating Abraham and his migration from Babylonia to Palestine about the beginning of the second millenium B.C. As to Hammurabi's date, see above, p. 244, note ¹.

the second millennium before our era.¹ Which, if either, of these views is the true one, we have at present no means of deciding.

It has been proposed to explain the Babylonian and Hebrew traditions of a great flood by the inundations to which the lower valley of the Euphrates and Tigris is annually exposed by the heavy rains and melting snows in the mountains of Armenia. "The basis of the story," we are told, "is the yearly phenomenon of the rainy and stormy season, which lasts in Babylonia for several months, and during which time whole districts in the Euphrates Valley are submerged. Great havoc was caused by the rains and storms until the perfection of canal systems regulated the overflow of the Euphrates and Tigris, when what had been a curse was converted into a blessing, and brought about that astonishing fertility for which Babylonia became famous. The Hebrew story of the Deluge recalls a particularly destructive season that had made a profound impression, and the comparison with the parallel story found on clay tablets of Ashurbanipal's library confirms this view of the local setting of the tale."² In favour of this view it may be said that in the Babylonian and the oldest form of the Hebrew tradition the cause of the Deluge is said to have been heavy rain.³ The theory may also be supported by the dangerous inundations to which the country is still yearly liable through the action of the same natural causes. When Loftus, the first excavator of the ancient city of Erech, arrived in Bagdad on the 5th of May, 1849, he found the whole population in a state of the utmost apprehension and alarm. In consequence of the rapid melting of the snows on the Kurdish mountains, and the enormous influx of water from the Euphrates through the Seglawiyya canal, the Tigris had risen that spring to the unprecedented height of twenty-two and a half feet, which was about five feet above its highest level in ordinary years and exceeded the great rise of 1831, when the river broke down the walls and destroyed no less than seven thousand dwellings in a single night, at a time when the plague was committing the most fearful ravages among the inhabitants. A few days before the arrival of the English party, the Turkish pasha of Bagdad had summoned the whole population, as one man, to guard against the general danger by raising a strong high mound completely round the walls. Mats of reeds were placed outside to bind the earth compactly together. The water was thus prevented from devastating the interior of the city, though it filtered through the fine alluvial soil and stood several feet deep in the cellars. Outside the city it reached to within two feet of the top of the bank. On the side of the river the houses alone, many of them very old and frail, prevented the ingress of the flood. It was a critical

¹ H. Gressmann, in *Das Gilgamesch-Epos übersetzt und erklärt*, von A. Ungnad und H. Gressmann, p. 220. On this theory, see Principal J. Skinner, *Critical and Exegetical Commentary on Genesis*, p. x, who objects to it that "there are no recognizable traces of a specifically Canaanite medium having been interposed between the Babylonian originals and the Hebrew accounts of the Creation and the Flood, such as we may surmise in the case of the Paradise myth."

² M. Jastrow *Hebrew and Babylonian Traditions*, pp. 37 sq.; compare *id.*, pp. 322 sq.

³ Above, pp. 239, 243, 245, 256.

juncture. Men were stationed night and day to watch the barriers. If the dam or any of the foundations had failed, Bagdad must have been bodily washed away. Happily the pressure was withstood, and the inundation gradually subsided. The country on all sides for miles was under water, so that there was no possibility of proceeding beyond the dyke, except in the boats which were established as ferries to keep up communication across the flood. The city was for a time an island in a vast inland sea, and it was a full month before the inhabitants could ride beyond the walls. As the summer advanced, the presence of the stagnant water caused malaria to such an extent that, out of a population of seventy thousand, no less than twelve thousand died of fever.¹

If the floods caused by the melting of the snow in the Armenian mountains can thus endanger the cities in the river valley down to modern times, it is reasonable to suppose that they did so in antiquity also, and that the Babylonian tradition of the destruction of the city of Shurippak in such an inundation may be well founded. It is true that the city appears to have ultimately perished by fire rather than by water;² but this is quite consistent with the supposition that at some earlier time it had been destroyed by a flood and afterwards rebuilt.

However, the theory which would explain the Babylonian and Hebrew tradition of a great flood by the inundations to which the country is annually exposed, may be combated by an argument drawn from the analogy of Egypt. For Egypt from time immemorial has been similarly subject to yearly inundations; yet it has never, so far as we know, either evolved a flood legend of its own or accepted the flood legend of its great Oriental rival. If annual floods sufficed to produce the legend in Babylonia, why, it may be asked, did not the same cause produce the same effect in Egypt?

To meet this difficulty a different explanation of the Babylonian story has been put forward in recent years by an eminent geologist, Professor Eduard Suess of Vienna. Regarding the regular annual changes in the basin of the Euphrates as insufficient to account for the legend, he has recourse to irregular or catastrophic causes. He points out that "there are other peculiarities of the Euphrates valley which may occasionally tend to exacerbate the evils attendant on the inundations. It is very subject to seismic disturbances; and the ordinary consequences of a sharp earthquake shock might be seriously complicated by its effect on a broad sheet of water. Moreover the Indian Ocean lies within the region of typhoons; and if, at the height of an inundation, a hurricane from the south-east swept up the Persian Gulf, driving its shallow waters upon the delta and damming back the outflow, perhaps for hundreds of miles up-stream, a diluvial catastrophe, fairly up to the mark of Hasisadra's, might easily result."³

¹ W. K. Loftus, *Travels and Researches in Chaldaea and Susiana* (London, 1857), pp. 7 sq.

² Above, p. 246.

³ T. H. Huxley, "Hasisadra's Adventure," *Collected Essays*, iv, 246 sq. Thus clearly and concisely does Huxley sum up the theory which Professor E. Suess expounds at great length in his work, *The Face of the Earth*, vol. i (Oxford, 1904), pp. 17-72.

In support of his catastrophic theory Professor Suess appeals to two features in the Hebrew version of the flood story, or rather to one feature which actually occurs in that version, and to another which he would import into it by altering the text so as to suit his hypothesis. We will consider each of his arguments separately.

In the first place Professor Suess points out that in the Hebrew narrative one cause alleged for the Deluge is the breaking out of subterranean waters.¹ "This rising of great quantities of water from the deep," he says, "is a phenomenon which is a characteristic accompaniment of earthquakes in the alluvial districts of great rivers. The subterranean water is contained in the recent deposits of the great plains on both sides of the stream, and its upper limit rises to right and left above the mean level of the river, its elevation increasing in proportion to the distance from the river. What lies beneath this limit is saturated and mobile; the ground above it is dry and friable. When seismic oscillations occur in a district of this kind the brittle upper layer of the ground splits open in long clefts, and from these fissures the underground water, either clear or as a muddy mass, is violently ejected, sometimes in great volumes, sometimes in isolated jets several yards high."² For example, the young alluvial land about the Danube in Wallachia was rent by an earthquake in 1838, and from the fissures water spouted out in many places fathoms high. The same thing happened when the alluvial plain of the Mississippi, a little below the confluence of the Ohio, was convulsed by an earthquake in January, 1812: the water that had filled the subterranean cavities forced a passage for itself and blew up the earth with loud explosions, throwing up an enormous quantity of carbonized wood in jets from ten to fifteen feet high, while at the same time the surface of the ground sank, and a black liquid rose as high as a horse's belly. Again, in January, 1862, a violent shock of earthquake affected the whole region south of Lake Baikal, and in particular the delta of the river Selenga which flows into the lake. In the town of Kudara the wooden lids of the fountains were shot into the air like corks from champagne bottles, and springs of tepid water rose in places to a height of more than twenty feet. So terrified were the Mongols that they caused the Lamas to perform ceremonies to appease the evil spirits which, as they imagined, were shaking the earth.³

On this it is to be observed that the reference to subterranean waters as one cause of the Deluge occurs only in the Hebrew version of the legend, and even there it is found only in the later Priestly narrative: it does not occur in the earlier Jehovistic narrative, nor in the still earlier Babylonian version⁴; nor, finally,

¹ Genesis vii, 11; viii, 2.

² E. Suess, *The Face of the Earth*, i, 31.

³ E. Suess, *The Face of the Earth*, i, 31 sq.

⁴ Professor Suess, indeed, discovers a reference to subterranean waters in a passage of the Babylonian legend which, following Professor Paul Haupt, he translates "the Anunnaki caused floods to rise," supposing the Anunnaki to be "the spirits of the deep, of the great subterranean waters" (*The Face of the Earth*, i, 31). But the better translation of that passage seems to be, "the Anunnaki lifted up flaming torches" (so P. Jensen, A. Jeremias, L. W. King, W. Muss

is it found in the original Sumerian legend from which both the Babylonian and the Hebrew stories are derived. Accordingly it may be dismissed as a late addition to the legend on which it would be unsafe to build any hypothesis.

But Professor Suess appeals to the Hebrew narrative for another argument in favour of his view that the Deluge was caused principally by a great sea-wave driven up from the Persian Gulf by the combined force of an earthquake and a typhoon. This he is enabled to do by altering the Hebrew text of Genesis in two passages so as to yield the meaning "the flood from the sea" instead of "the flood of waters."¹ The textual change, it is true, is very slight, for it extends only to the vowel-points and leaves the consonants unaffected. But though the vowel-points form no part of the original Hebrew text of the Scriptures, having been introduced into it not earlier than the sixth century of our era, they are not to be lightly altered, since they represent the traditional pronunciation of the sacred words, as it had been handed down with scrupulous care, generation after generation, by a guild of technically trained scholars, the Massorets, as they were called, who "devoted themselves to preserving not only the exact writing of the received consonantal text, but the exact pronunciation and even the musical cadence proper to every word of the sacred text, according to the rules of the synagogal chanting."² Hence the proposed emendation in the two verses of Genesis has been rightly rejected by the best recent scholars,³ and with it the appeal to the Hebrew text for evidence of the marine origin of the great flood must be dismissed as unfounded.

It does not of course follow that Professor Suess's explanation of the Babylonian Deluge is false because the arguments in favour of it which he deduces from the Biblical narrative carry little or no weight. If that narrative, as seems probable, rests on a basis of fact, it is quite possible that the Great Flood which it describes may actually have been produced by an earthquake or a typhoon, or by both combined. But the theory that it was so produced derives extremely little support from the only authorities open to us, the Hebrew, Babylonian, and Sumerian traditions; hence it hardly amounts to more than a plausible conjecture. On a simple calculation of chances, it seems more likely that the catastrophe was brought about by forces which are known to act regularly every year on the Euphrates valley, and to be quite capable of producing widespread inundations, rather than by assumed forces which, though certainly capable of causing

Arnolt, M. Jastrow, P. Dhorme, A. Ungnad, R. W. Rogers). Hence the reference must be to some phenomena, not of water, but of light, perhaps to flashes of lightning, as Jensen and Dhorme suggest (see P. Jensen, *Assyrisch-Babylonische Mythen und Epen*, p. 580; P. Dhorme, *Choix de Textes Religieux Assyro-Babyloniens*, p. 110).

¹ Genesis vi, 17, and vii, 6, reading מִן הַיָּם for מֵי הַיָּם (*miyam for mayim*).

² W. Robertson Smith, *The Old Testament in the Jewish Church*² (London and Edinburgh, 1892), p. 58. As to the Massorets and their work, see W. R. Smith, *op. cit.*, pp. 58–60.

³ A. Dillmann and J. Skinner, in their commentaries, explicitly; S. R. Driver and W. H. Bennett, in their commentaries, implicitly. In his critical edition of the Hebrew text (*Biblia Hebraica*, Part i, Leipsic, 1905, p. 8) R. Kittel rejects מִן הַיָּם as a gloss.

disastrous floods, are not positively known to have ever acted on the region in question; for, apart from the supposed references in Semitic tradition, I am aware of no record of a Babylonian deluge caused either by an earthquake wave or by a typhoon.

§4. ANCIENT GREEK STORIES OF A GREAT FLOOD.

Legends of a destructive deluge, in which the greater part of mankind perished, meet us in the literature of ancient Greece. As told by the mythographer Apollodorus the story runs thus: "Deucalion was the son of Prometheus. He reigned as king in the country about Phthia and married Pyrrha, the daughter of Epimetheus and Pandora, the first woman fashioned by the gods. But when Zeus wished to destroy the men of the Bronze Age, Deucalion by the advice of Prometheus constructed a chest or ark, and having stored in it what was needful he entered into it with his wife. But Zeus poured a great rain from the sky upon the earth and washed down the greater part of Greece, so that all men perished except a few, who fled to the high mountains near. Then the mountains in Thessaly were parted, and all the world beyond the Isthmus and Peloponnese was overwhelmed. But Deucalion in the ark, floating over the sea for nine days and as many nights, grounded on Parnassus, and there, when the rain ceased, he disembarked and sacrificed to Zeus, the God of Escape. And Zeus sent Hermes to him and allowed him to choose what he would, and he chose men. So Zeus bade him pick up stones and throw them over his head; and the stones which Deucalion threw became men, and the stones which Pyrrha threw became women. That is why in Greek people are called *laoi* from *laas*, 'a stone.'"¹

In this form the Greek legend is not older than about the middle of the second century before our era, the time when Apollodorus wrote, but in substance it is much more ancient, for the story was told by Hellanicus, a Greek historian of the fifth century B.C., who said that Deucalion's ark drifted not to Parnassus but to Mount Othrys in Thessaly.² The other version has the authority of Pindar, who wrote earlier than Hellanicus in the fifth century B.C.; for the poet speaks of Deucalion and Pyrrha descending from Parnassus and creating the human race afresh out of stones.³ According to some, the first city which they founded after the great flood was Opus, situated in the fertile Locrian plain between the mountains and the Euboic Gulf. But Deucalion is reported to have dwelt at Cynus, the port of Opus, distant a few miles across the plain; and there his wife's tomb was shown to travellers down to the beginning of our era. Her husband's dust is said to have rested at Athens.⁴ The coast of Locris, thus associated with

¹ Apollodorus, *Bibliotheca*, i, 7, 2.

² Scholiast on Pindar, *Olymp.*, ix, 64; *Fragmenta Historicorum Graecorum*, ed. C. Müller, i, 48.

³ Pindar, *Olymp.*, ix, 64 *sqq.*

⁴ Strabo, ix, 4, 2, p. 425, ed. Casaubon.

traditions of the Great Flood, is rich in natural beauties. The road runs at the foot of the mountains, which are of soft and lovely outlines, for the most part covered with forest; while the low hills and glades by the sea are wooded with pines, plane-trees, myrtles, lentisks, and other trees and shrubs, their luxuriant verdure fed by abundant springs. Across the blue waters of the gulf the eye roams to the island of Eubœa, with its winding shores and long line of finely cut mountains standing out against the sky. The home of Deucalion was on a promontory running out into the gulf. On it, and on the isthmus which joins it to the land, may still be seen the mouldering ruins of Cynus: a line of fortification walls, built of sandstone, runs round the edge of the height, and the summit is crowned by the remains of a mediæval tower. The ground is littered with ancient potsherds.¹

It is said that an ancient city on Parnassus was overwhelmed by the rains which caused the deluge, but the inhabitants, guided by the howling of wolves, found their way to the peaks of the mountain, and when the flood had subsided they descended and built a new city which they called Lycorea or Wolf-town in gratitude for the guidance of the wolves.² Lucian speaks of Deucalion's ark, with the solitary survivors of the human race, grounding on what was afterwards the site of Wolf-town, while as yet all the rest of the world was submerged.³ But according to another account, the mountain to which Deucalion escaped was a peak in Argolis, which was afterwards called Nemea after the cattle which cropped the greensward on its grassy slopes. There the hero built an altar in honour of Zeus the Deliverer, who had delivered him from the Great Flood.⁴ The mountain on which he is said to have alighted is probably the table-mountain, now called Phouka, whose broad flat top towers high above the neighbouring hills, and forms a conspicuous landmark viewed from the plain of Argos.⁵

The Megarians told how in Deucalion's flood Megarus, son of Zeus, escaped by swimming to the top of Mount Gerania, being guided by the cries of some cranes, which flew over the rising waters and from which the mountain afterwards received its new name.⁶ According to Aristotle, writing in the fourth century B.C., the ravages of the deluge in Deucalion's time were felt most sensibly "in ancient Hellas, which is the country about Dodona and the River Achelous, for that river has changed its bed in many places. In those days the land was inhabited by the Selli and the people who were then called Greeks (*Graikoi*) but are now named

¹ Ludwig Ross, *Wanderungen in Griechenland* (Halle, 1851), i, 94 *sq.*

² Pausanias, x, 6, 2.

³ Lucian, *Timon*, 3. Elsewhere he refers to the ark and to the creation of men out of stones (*De Saltatione*, 39).

⁴ *Etymologicum Magnum*, p. 176, *s.v.* 'Αφέσιος, referring to the Second Book of Arrian's *Bithyniaca*.

⁵ The modern *Phouka* seems to be the *Apesas* of the ancients (Pausanias, ii, 5, 3, with the note in my commentary), which again seems to be connected with Zeus *Aphesios* (Deliverer), to whom Deucalion built an altar on the mountain.

⁶ Pausanias, i, 40, 1 (Gerania from *geranoi*, "cranes").

Hellenes.”¹ Some people thought that the sanctuary at Dodona was founded by Deucalion and Pyrrha, who dwelt among the Molossians of that country.² In the fourth century B.C., Plato also mentions, without describing, the flood which took place in the time of Deucalion and Pyrrha, and he represents the Egyptian priests as ridiculing the Greeks for believing that there had been only one deluge, whereas there had been many.³ The Parian chronicler, who drew up his chronological table in the year 265 B.C.,⁴ dated Deucalion’s flood one thousand two hundred and sixty-five years before his own time⁵; according to this calculation the cataclysm occurred in the year 1539 B.C.

At a later age the Roman poet Ovid decked out the tradition of the Great Flood in the pinchbeck rhetoric which betrayed the decline of literary taste. He tells us that Jupiter, weary of the wickedness and impiety of the men of the Iron Age, resolved to destroy the whole of mankind at one fell swoop. His first idea was to overwhelm them under the flaming thunderbolts which he brandished in his red right hand; but on reflection he laid these dangerous weapons aside, lest the upper air and heaven itself should catch fire from the great conflagration which they would kindle on earth; and in this prudent resolution he was confirmed by an imperfect recollection of an old prophecy that the whole world, sky and earth alike, was destined to perish in a grand and final combustion. Accordingly he decided on the safer course of turning on the celestial taps and drowning the whole wicked race under the tremendous shower bath. So he shut up the North Wind in the cave of Aeolus, to prevent him from sweeping the murky clouds from the blue sky, and he let loose the South Wind, who flew abroad rigged out in all the stage properties calculated to strike terror into the beholder. He flapped his dripping wings: his dreadful face was veiled in pitchy blackness: mists sat on his forehead, his beard was soaking wet, and water ran down from his hoary hair. In his train the sky lowered, thunder crashed, and the rainbow shone in spangled glory against the dark rain-clouds. To help the sky-god in his onslaught on mankind his sea-blue brother Neptune summoned an assembly of the rivers and bade them roll in flood over the land, while he himself fetched the earth a smashing blow with his trident, causing it to quake like a jelly. The fountains of the great deep were now opened. The deluge poured over the fields and meadows, whirling away trees, cattle, men and houses. Far and wide nothing was to be seen but a shoreless sea of tossing turbid water. The farmer now rowed in a shallop over the field where he had lately guided the oxen at the plough-tail, and peering down he could discern his crops and the roof of his farmhouse submerged under the waves. He dropped his anchor on a green meadow, his keel grated on

¹ Aristotle, *Meteorolog.*, i, 14, p. 352, ed. Im. Bekker (Berlin, 1831).

² Plutarch, *Pyrrhus*, 1.

³ Plato, *Timæus* pp. 22A, 23B.

⁴ L. Ideler, *Handbuch der mathematischen und technischen Chronologie* (Berlin, 1825–6), i 380 sqq.

⁵ *Marmor Parium*, 6 sqq., in *Fragmenta Historicorum Graecorum*, ed. C. Müller, i, 542.

his own vineyard, and he fished for trout on the tops of the tall elms. Seals now lolled and sprawled where goats had lately nibbled the herbage, and dolphins gambolled and plunged in the woods. When at last nothing remained above the waste of waters but the two peaks of Parnassus, toppling over the heaving billows and reaching up above the clouds, Deucalion and his wife drifted in a little boat to the mountain, and landing adored the nymphs of the Corycian cave and the prophetic goddess Themis, who managed the business of the oracle before it was taken over by Apollo. A righteous and god-fearing man was Deucalion, and his wife was just such another. Touched with compassion at the sight of the honest pair, the sole survivors of so many thousands, Jupiter now dispersed the clouds and the deluge, revealing the blue sky and the green earth to each other once more. So Neptune also laid aside his trident, and summoning the bugler Triton, his back blue with the growth of the purple-shell, he ordered him to sound the "Retire." The bugler obeyed, and putting the shell to his lips he blew from his puffed cheeks such a blast that at the sound of it all the waves and rivers fell back and left the land high and dry. This was all very well, but what were Deucalion and Pyrrha to do now, left solitary in a desolated world, where not a sound broke the dreadful silence save the melancholy lapping of the waves on the lonely shore? They shed some natural tears, and then wiping them away they resolved to consult the oracle. So pacing sadly by the yellow turbid waters of the Cephissus they repaired to the temple of the goddess. The sacred edifice presented a melancholy spectacle, its walls still overgrown with moss and sea-weed, its courts still deep in slime; and naturally no fire flamed or smouldered on the defiled altars. However, the goddess was fortunately at home, and in reply to the anxious inquiries of the two suppliants she instructed them, as soon as they had quitted the temple, to veil their heads, unloose their robes, and throw behind their backs the bones of their great parent. This strange answer bewildered them, and for a long time they remained silent. Pyrrha was the first to find her voice, and when at last she broke silence it was to declare respectfully but firmly that nothing would induce her to insult her mother's ghost by flinging her bones about. Her husband, more discerning, said that perhaps by their great parent the goddess meant them to understand the earth, and that by her bones she signified the rocks and stones embedded in the ground. They were not very hopeful of success, but, nothing else occurring to them to do, they decided to make the attempt. So they carried out the instructions of the oracle to the letter, and sure enough the stones which Deucalion threw turned into men, and the stones which Pyrrha threw turned into women. Thus was the earth repopled after the great flood.¹

Anyone who compares the laboured ingenuity of this account of the Deluge with the majestic simplicity of the corresponding narrative in Genesis is in a

¹ Ovid, *Metamorphoses*, i, 125-415. The fish sticking in the tops of the elms are borrowed from Horace (*Odes*, i, 9 *sq.*).

position to measure the gulf which divides great literature from its tinsel imitation.

In his account of the catastrophe Ovid so far followed ancient Greek tradition as to represent Deucalion and Pyrrha landing on the peak of Parnassus. Later Roman writers carried the pair much farther afield; one of them landed the voyagers on Mount Athos,¹ and another conveyed them as far as Mount Etna.²

Various places in Greece, as we have seen, claimed the honour of having been associated in a particular manner with Deucalion and the Great Flood. Among the claimants, as might have been expected, were the Athenians, who, pluming themselves on the vast antiquity from which they had inhabited the land of Attica, had no mind to be left out in the cold when it came to a question of Deucalion and the Deluge. They annexed him accordingly by the simple expedient of alleging that when the clouds gathered dark on Parnassus and the rain came down in torrents on Lycorea, where Deucalion reigned as king, he fled for safety to Athens, and on his arrival founded a sanctuary of Rainy Zeus, and offered thank-offerings for his escape.³ In this brief form of the legend there is no mention of a ship, and we seem to be left to infer that the hero escaped on foot. Be that as it may, he is said to have founded the old sanctuary of Olympian Zeus, and to have been buried in the city. Down to the second century of our era the local Athenian guides pointed with patriotic pride to the grave of the Greek Noah near the later and far statelier temple of Olympian Zeus, whose ruined columns, towering in solitary grandeur above the modern city, still attract the eye from far, and bear silent but eloquent witness to the glories of ancient Greece.⁴

Nor was this all that the guides had to show in memory of the tremendous cataclysm. Within the great precinct overshadowed by the vast temple of Olympian Zeus they led the curious traveller to a smaller precinct of Olympian Earth, where they pointed to a cleft in the ground a cubit wide. Down that cleft, they assured him, the waters of the Deluge ran away, and down it every year they threw cakes of wheaten meal kneaded with honey.⁵ These cakes would seem to have been soul-cakes destined for the consumption of the poor souls who perished in the Great Flood; for we know that a commemoration service or requiem mass was celebrated every year at Athens in their honour. It was called the Festival of the Water-bearing,⁶ which suggests that charitable people not only threw cakes but poured water down the cleft in the ground to slake the thirst as well as to stay the hunger of the ghosts in the nether world.

¹ Servius, on Virgil, *Bucol.*, vi, 41.

² Hyginus, *Fabulae*, 153.

³ *Marmor Parium*, 6 sq., in *Fragmenta Historicorum Graecorum*, ed. C. Müller, i, 542.

⁴ Pausanias, i, 18, 8. The tomb of Deucalion at Athens is mentioned also by Strabo, ix, 4, 2, p. 425.

⁵ Pausanias, i, 18, 7.

⁶ Plutarch, *Sulla*, 14; *Etymologicum Magnum*, p. 774, s.v. ὑδροφορία; Hesychius, s.v. ὑδροφόρια. The festival fell at the new moon in the month of Anthesterion (Plutarch, l.c.). Compare Schol. on Aristophanes, *Acharnians*, 1076, and on *Frogs*, 218; August Mommsen, *Feste der Stadt Athen im Altertum* (Leipzig, 1898), pp. 424 sq.

Another place where the Great Flood was commemorated by a similar ceremony was Hierapolis on the Euphrates. There down to the second century of our era the ancient Semitic deities were worshipped in the old way under a transparent disguise imposed on them, like modern drapery on ancient statues, by the nominally Greek civilization which the conquests of Alexander had spread over the East. Chief among these aboriginal divinities was the great Syrian goddess Astarte, who to her Greek worshippers masqueraded under the name of Hera. Lucian has bequeathed to us a very valuable description of the sanctuary and the strange rites performed in it.¹ He tells us that according to the general opinion the sanctuary was founded by Deucalion, in whose time the Great Flood took place. This gives Lucian occasion to relate the Greek story of the Deluge, which according to him ran as follows. The present race of men, he says, are not the first of human kind; there was another race which perished wholly. We are of the second breed, which multiplied after the time of Deucalion. As for the folk before the Flood, it is said that they were exceedingly wicked and lawless; for they neither kept their oaths, nor gave hospitality to strangers, nor respected suppliants, wherefore the great calamity befell them. So the fountains of the deep were opened, and the rain descended in torrents, the rivers swelled, and the sea spread far over the land, till there was nothing but water, water everywhere, and all men perished. But Deucalion was the only man who, by reason of his prudence and piety, survived and formed the link between the first and the second race of men; and the way in which he was saved was this. He had a great ark, and into it he entered with his wives and children; and as he was entering there came to him pigs, and horses, and lions, and serpents, and all other land animals, all of them in pairs. He received them all, and they did him no harm; nay, by God's help there was a great friendship between them, and they all sailed in one ark so long as the flood prevailed on the earth. Such, says Lucian, is the Greek story of Deucalion's deluge; but the people of Hierapolis, he goes on, tell a marvellous thing. They say that a great chasm opened in their country, and all the water of the flood ran away down it. And when that happened, Deucalion built altars and founded a holy temple of Hera beside the chasm. "I have seen the chasm," he proceeds, "and a very small one it is under the temple. Whether it was large of old and has been reduced to its present size in course of time I know not, but what I saw is undoubtedly small. In memory of this legend they perform the following ceremony. Twice a year water is brought from the sea to the temple. It is brought not by the priests only, but by all Syria and Arabia, ay and from beyond the Euphrates many men go to the sea, and all of them bring water. The water is poured into the chasm, and though the chasm is small, yet it receives a mighty

¹ *De dea Syria*. The modern scepticism as to the authorship of this treatise is purely arbitrary and rests on no better foundation than that uncritical criticism which aims, not so much at the discovery of truth, as at the display of the critic's acumen in doubting or denying what everybody else had believed before he was born, and what most sensible people will continue to believe long after he is dead.

deal of water. In doing this they say that they comply with the custom which Deucalion instituted in the sanctuary for a memorial at once of calamity and of mercy."¹ Moreover, at the north gate of the great temple there stood two tall columns, or rather obelisks, each about three hundred and sixty feet high; and twice a year a man used to ascend one of them and remain for seven days in that airy situation on the top of the obelisk. Opinions differed as to why he went there, and what he did up aloft. Most people thought that at that great height he was within hail of the gods in heaven, who were near enough to hear distinctly the prayers which he offered on behalf of the whole land of Syria. Others, however, opined that he clambered up the obelisk to signify how men had ascended to the tops of mountains and of tall trees in order to escape from the waters of Deucalion's flood.²

In this late Greek version of the deluge legend the resemblances to the Babylonian version are sufficiently close; and a still nearer trait is supplied by Plutarch, who says that Deucalion let loose a dove from the ark in order to judge by its flight or its return whether the storm still continued or had abated.³ In this form the Greek legend of the great flood was unquestionably coloured, if not moulded, by Semitic influence, whether the colours and the forms were imported from Israel or from Babylon.

But Hierapolis, on the Euphrates, was not the only place in Western Asia which Greek tradition associated with the deluge of Deucalion. There was, we are told, a certain Nannacus, King of Phrygia, who lived before the time of Deucalion, and, foreseeing the coming catastrophe, gathered his people into the sanctuaries, there to weep and pray. Hence "the age of Nannacus" became a proverbial expression for great antiquity or loud lamentations.⁴ According to another account, Nannacus (or Annacus), the Phrygian, lived over 300 years, and when his neighbours, apparently tired of the old man, inquired of the oracle how much longer he might be expected to live, they received the discouraging reply that when the patriarch died all men would perish with him. So the Phrygians lamented bitterly, which gave rise to the old proverb about "weeping for Nannacus."⁵ The Greek satyric poet Herodas puts the proverb in the mouth of a mother who brings her brat to the schoolmaster to receive a richly deserved thrashing; and in so doing she refers sorrowfully to the cruel necessity she was under of paying the school fees, even though she were to "weep like Nannacus."⁶ When the Deluge

¹ Lucian, *De dea Syria*, 12 sq. In the opening words of this passage (οἱ μὲν ὦν πολλοὶ Δευκαλίωνα τὸν Σισύθρα τὸ ἱερὸν εἰσάσθαι λέγουσι) the name Σισύθρα is an emendation of Buttmann's for the MS. reading Σκύθρα. See Ph. Buttmann, *Mythologus* (Berlin, 1828-9), i, 191 sq. If the emendation is correct the name Sisylthes may be, as scholars suppose, a variant of Xisuthrus, the name of the hero in Berosus's Greek version of the flood legend. See above, p. 234; and H. Usener, *Die Sintfluthsagen*, pp. 47 sq.

² Lucian, *De dea Syria*, 28.

³ Plutarch, *De sollertia animalium*, 13.

⁴ Suidas, s.v. Νάννακος; Zenobius, *Cent.*, vi, 10; Macarius, *Cent.*, ii, 23, viii, 4; Apostolius, *Cent.*, xv, 100.

⁵ Stephanus Byzantius, s.v. Ἰκόνιον.

⁶ Herodas, *Mimes*, iii, 10.

had swept away the whole race of mankind, and the earth had dried up again, Zeus commanded Prometheus and Athena to fashion images of mud, and then, summoning the winds, he bade them breathe into the mud images and make them live. So the place was called Iconium, after the images (*eikones*) which were made there.¹ Some have thought that the patriarchal Nannacus, or Annacus, was no other than the Biblical Enoch, or Hanoah,² who lived before the Flood for 365 years, and was then removed from the world in a mysterious fashion.³ But against this identification it is to be said that the name Nannacus would seem to be genuine Greek, since it occurs in Greek inscriptions of the island of Cos.⁴

Another city of Asia Minor which appears to have boasted of its connexion with the Great Flood was Apamea Cibotos, in Phrygia. The surname of Cibotos, which the city assumed,⁵ is the Greek word for chest, or ark; and on coins of the city, minted in the reigns of Severus, Macrinus, and Philip the Elder, we see the ark floating on water with two passengers in it, whose figures appear from the waist upwards; beside the ark two other human figures, one male and the other female, are represented standing; and lastly, on the top of the chest are perched two birds, one of them said to be a raven and the other a dove carrying an olive-branch. As if to remove all doubt as to the identification of the legend, the name Noe, the Greek equivalent of Noah, is inscribed on the ark. No doubt the two human figures represent Noah and his wife twice over, first in the ark, and afterwards outside of it.⁶ These coin types prove unquestionably that in the third century of our era the people of Apamea were acquainted with the Hebrew tradition of the Noachian deluge in the form in which the story is narrated in the Book of Genesis. They may easily have learned it from their Jewish fellow-citizens, who in the first century before our era were so numerous or so wealthy that on one occasion they contributed no less than 100 pounds weight of gold to be sent as an offering to Jerusalem.⁷ Whether at Apamea the tradition of the Deluge

¹ Stephanus Byzantius, *s.v.* 'Ικόνιον.

² הֲנוֹךְ

³ Genesis v, 23 *sq.* The identification, first suggested by Ph. Buttmann (*Mythologus*, Berlin, 1828-9, i, 175 *sqq.*, 187 *sq.*), is accepted by E. Babelon. See E. Babelon, "La Tradition Phrygienne du Déluge," *Revue de l'Histoire des Religions*, xxiii (1891), p. 180. Buttmann even identified Aeacus, the righteous hero of Aegina, with Nannacus and Enoch.

⁴ H. Collitz und F. Bechtel, *Sammlung der griechischen Dialekt-Inschriften*, iii, 1 (Göttingen, 1899), p. 342, Inscr. No. 3623 c, 51; G. Dittenberger, *Sylloge Inscriptionum Graecarum*² (Leipsic, 1898-1901), ii, p. 732, No. 885.

⁵ Strabo, xi, 6, 3, and 8, 13, pp. 569, 576, ed. Casaubon; Pliny, *Nat. Hist.*, v, 106. Adolphe Reinach preferred to suppose that the name is a native Asiatic word assimilated by popular etymology to a Greek one. He compared Kibyra, Kibyza, Kybistra, and Kybela. See his *Noé Sangarioü* (Paris, 1913), pp. 38 *sq.*

⁶ Barclay V. Head, *Historia Numorum* (Oxford, 1887), p. 558; E. Babelon, "La Tradition Phrygienne du Déluge," *Revue de l'Histoire des Religions*, xxiii (1891), pp. 180 *sq.*

⁷ Cicero, *Pro Flacco*, 28. We know from Josephus (*Antiquit. Jud.*, xii, 3, 4) that Antiochus the Great issued orders for transplanting two thousand Jewish families from Mesopotamia and Babylonia to Lydia and Phrygia, and for settling them there as colonists on very liberal terms. This may well have been the origin of the Jewish settlement at Apamea, as E. Babelon has

was purely Jewish in origin, or whether it was grafted upon an old native legend of a great flood, is a question on which scholars are not agreed.¹

Though the deluge associated with the name of Deucalion was the most familiar and famous, it was not the only one recorded by Greek tradition. Learned men, indeed, distinguished between three such great catastrophes which had befallen the world at different epochs. The first, we are told, took place in the time of Ogyges, the second in the time of Deucalion, and the third in the time of Dardanus.² Ogyges (or Ogygus, as the name is also spelled) is said to have founded and reigned over Thebes in Bœotia,³ which, according to the learned Varro, was the oldest city in Greece, having been built in antediluvian times before the earliest of all the floods.⁴ The connexion of Ogyges with Bœotia in general and with Thebes in particular is further vouched for by the name Ogygian which was bestowed on the land,⁵ on the city,⁶ and on one of its gates.⁷ Yet the Athenians, jealous of the superior antiquity which this tradition assigned to their hated rival, claimed the ancient Bœotian hero as an aboriginal of their country⁸; one tradition describes Ogyges as a king of Attica,⁹ and another represents him as the founder and king of Eleusis.¹⁰ So great was the devastation wrought in Attica by the flood that the country remained without kings from the time of Ogyges down to the reign of Cecrops.¹¹ If we may trust the description of a rhetorical

pointed out ("La Tradition Phrygienne du Déluge," *Revue de l'Histoire des Religions*, xxiii (1891), pp. 177 sq.).

¹ The view that the flood legend of Apamea was purely Jewish, without any basis of local tradition, is maintained by E. Babelon ("La Tradition Phrygienne du Déluge," *Revue de l'Histoire des Religions*, xxiii (1891), pp. 174–83). On the other hand, the composite character of the Apamean legend was maintained by H. Usener (*Die Sintfluthsage*, pp. 48–50) and advocated, with a great array of learning, by Adolphe Reinach in his treatise, *Noé Sangariou* (Paris, 1913). I confess that the arguments adduced in favour of an aboriginal flood legend at Apamea appear to me to carry little weight, resting rather on a series of doubtful combinations than on any solid evidence.

² Nonnus, *Dionys.*, iii, 202–19; Scholiast on Plato, *Timæus*, p. 22A. That the deluge of Ogyges was prior to the deluge of Deucalion is affirmed also by Augustine (*De Civitate Dei*, xviii, 8) and Servius (on Virgil, *Eclog.*, vi, 41), neither of whom, however, mention the deluge of Dardanus.

³ Pausanias, ix, 5, 1; Servius, on Virgil, *Eclog.*, vi, 41, "sub Ogyge, rege Thebanorum."

⁴ Varro, *Rerum Rusticarum*, iii, 1.

⁵ Strabo, ix, 2, 18, p. 407, ed. Casaubon; Stephanus Byzantius, s.v. *Βοιωτία*.

⁶ Pausanias, ix, 5, 1; Apollonius Rhodius, *Argonaut.*, iii, 1178; Festus, *De verborum significatione*, s.v. "Ogygia," p. 179, ed. C. O. Müller.

⁷ Euripides, *Phoenissæ*, 1113; Pausanias, ix, 8, 5; Scholiast on Apollonius Rhodius, *Argonaut.*, iii, 1178.

⁸ Africanus, quoted by Eusebius, *Praeparatio Evangelica*, x, 10, 4.

⁹ Scholiast on Plato, *Timæus*, p. 22A.

¹⁰ Africanus, quoted by Eusebius, *Praeparatio Evangelica*, x, 10, 7; Eusebius, *Chronic.*, ed. A. Schoene, vol. ii, p. 17; Isidorus Hispalensis, *Origines*, xiii, 22, 3. Some said that the hero Eleusis, from whom the city took its name, was a son of Ogygus (Pausanias, i, 38, 7).

¹¹ Africanus, quoted by Eusebius, *Praeparatio Evangelica*, x, 10, 9. Among the authorities cited by Africanus (in Eusebius, *op. cit.*, x, 10, 5) are the Attic historians Hellanicus and Philochorus.

poet, the whole earth was submerged by the Deluge, even the lofty peaks of Thessaly were covered, and the snowy top of Parnassus itself was lashed by the snowy billows.¹ With regard to the date of the catastrophe, some writers of antiquity profess to give us more or less exact information. The learned Roman scholar Varro tells us that the Boeotian Thebes was built about 2,100 years before the time when he was writing, which was in or about the year 36 B.C.; and as the Deluge, according to him, took place in the lifetime of Ogyges, but after he had founded Thebes, we infer that in Varro's opinion the Great Flood occurred in or soon after the year 2136 B.C.² Still more precise is the statement of Julius Africanus, a Christian author who drew up a chronicle of the world from the Creation down to the year 221 A.D. He affirms that the deluge of Ogyges happened just 1,020 years before the first Olympiad, from which the Greeks dated their exact reckoning; and as the first Olympiad fell in the year 776 B.C., we arrive at the year 1796 B.C. as the date to which the Christian chronicler referred the date of the great Ogygian flood. It happened, he tells us, in the reign of Phoroneus, king of Argos. He adds for our further information that Ogyges, who survived the deluge to which he gave his name, was a contemporary of Moses and flourished about the time when that great prophet led the children of Israel out of Egypt; and he clinches his chain of evidence by observing that at a time when God was visiting the land of Egypt with hailstorms and other plagues, it was perfectly natural that distant parts of the earth should simultaneously feel the effects of the divine anger, and in particular it was just and right that Attica should smart beneath the rod, since according to some people, including the historian Theopompus, the Athenians were in fact colonists from Egypt and therefore shared the guilt of the mother-country.³ According to the Church historian Eusebius, the great flood in the time of Ogyges occurred about one thousand two hundred years after the Noachian deluge and two hundred and fifty years before the similar catastrophe in the days of Deucalion.⁴ It would seem indeed to have been a point of honour with the early Christians to claim for the flood recorded in their sacred books an antiquity far more venerable than that of

¹ Nonnus, *Dionys*, iii, 206-8.

² Varro, *Rerum Rusticarum*, iii, 1, 3. In his preface to this treatise on agriculture (bk. i, ch. i) Varro indicates that it was written in his eightieth year; and as he was born in 116 B.C., he must have been composing the work in question in or about 36 B.C. From Arnobius (*Adversus Gentes*, v, 8) we learn that Varro reckoned less than two thousand years from Deucalion's flood to the consulship of Hirtius and Pansa in 43 B.C., which seems to show that he dated Deucalion's flood fully a hundred years later than that of Ogyges. Compare the commentary of Meursius on Varro, printed in J. G. Schneider's edition of the *Scriptores Rei Rusticae Veteres Latini* (Leipsic, 1794-6), vol. i, part 2, p. 491.

³ Julius Africanus, quoted by Eusebius, *Praeparatio Evangelica*, x, 10. That the deluge of Ogyges happened in the reign of Phoroneus, King of Argos, is mentioned also by the Christian writers, Tatian (*Oratio ad Graecos*, p. 150, ed. J. C. T. Otto) and Clement of Alexandria (*Strom.*, i, 21, § 102, p. 379, ed. Potter). Compare H. Fynes Clynton, *Fasti Hellenici*, i (Oxford, 1834), pp. 5-8.

⁴ Eusebius, *Chronic.*, ed. A. Schoene, vol. i, col. 71.

any flood described in mere profane writings. We have seen that Julius Africanus depresses Ogyges from the age of Noah to that of Moses; and Isidore, the learned bishop of Seville at the beginning of the seventh century, heads his list of floods with the Noachian deluge, while the second and third places in order of time are assigned to the floods of Ogyges and Deucalion respectively; according to him, Ogyges was a contemporary of the patriarch Jacob, while Deucalion lived in the days of Moses. The bishop was, so far as I am aware, the first of many writers who have appealed to fossil shells imbedded in remote mountains as witnesses to the truth of the Noachian tradition.¹

If Ogyges was originally, as seems probable, a Bœotian rather than an Attic hero, the story of the deluge in his time may well have been suggested by the vicissitudes of the Copaic Lake which formerly occupied a large part of Central Bœotia.² For, having no outlet above ground, the lake depended for its drainage entirely on subterranean passages or chasms which the water had hollowed out for itself in the course of ages through the limestone rock, and according as these passages were clogged or cleared the level of the lake rose or fell. In no lake, perhaps, have the annual changes been more regular and marked than in the Copaic; for while in winter it was a reedy mere, the haunt of thousands of wild fowl, in summer it was a more or less marshy plain, where cattle browsed and crops were sown and reaped. So well recognized were the vicissitudes of the seasons that places on the bank of the lake such as Orchomenus, Lebadea, and Copae, had summer roads and winter roads by which they communicated with each other, the winter roads following the sides of the hills, while the summer roads struck across the plain. With the setting in of the heavy autumn rains in November the lake began to rise and reached its greatest depth in February or March, by which time the mouths of the emissories were completely submerged and betrayed their existence only by swirls on the surface of the mere. Yet even then the lake presented to the eye anything but an unbroken sheet of water. Viewed from a height, such as the acropolis of Orchomenus, it appeared as an immense fen, of a vivid green colour, stretching away for miles and miles, overgrown with sedge, reeds, and canes, through which the river Cephissus or Melas might be seen sluggishly oozing, while here and there a gleam of sunlit water, especially towards the north-east corner of the mere, directed the eye to what looked like ponds in the vast green swamp. Bare grey mountains on the north and east, and the beautiful wooded slopes of Helicon on the south, bounded the fen. In spring the water began to sink. Isolated brown patches, where no reeds grew, were the first to show as islands in the mere; and as the season advanced they expanded more and more till they met. By the middle of summer great stretches, especially in the middle and at the edges, were bare. In the higher parts the fat alluvial soil left by the retiring waters was sown

¹ Isidorus Hispalensis, *Origines*, xiii, 22, "*cujus indicium hactenus videmus in lapidibus, quos in remotis montibus conchis et ostris concretos, saepe etiam caratos aquis visere solemus.*"

² Ed. Meyer, *Geschichte des Alterthums*, ii (Stuttgart, 1896), p. 194.

by the peasants and produced crops of corn, rice, and cotton; while the lower parts, overgrown by rank grass and weeds, were grazed by herds of cattle and swine. In the deepest places of all the water often stagnated the whole summer, though there were years when it retreated even from these, leaving behind it only a bog or perhaps a stretch of white clayey soil, perfectly dry, which the summer heat seamed with a network of minute cracks and fissures. By the end of August the greater part of the basin was generally dry, though the water did not reach its lowest point till October. At that time what had lately been a fen was only a great brown expanse, broken here and there by a patch of green marsh, where reeds and other water-plants grew. In November the lake began to fill again fast.

Such was the ordinary annual cycle of changes in the Copaic Lake in modern times, and we have no reason to suppose that it was essentially different in antiquity. But at all times the water of the lake has been liable to be raised above or depressed below its customary level by unusually heavy or scanty rainfall in winter or by the accidental clogging or opening of the chasms. As we read in ancient authors of drowned cities on the margin of the lake,¹ so a modern traveller tells of villagers forced to flee before the rising flood, and of vineyards and corn-fields seen under water.²

Among the dead cities of which the ruins are scattered in and around the wide plain which was once the Copaic Lake none is more remarkable or excites our curiosity more keenly than one which bears the modern name of Goulas or Gla. Its ancient name and history are alike unknown: even legend is silent on the subject. The extensive remains occupy the broad summit of a low rocky hill or tableland which rises abruptly on all sides from the dead flat of the surrounding country. When the lake was full, the place must have been an island, divided by about a mile of shallow and weedy water from the nearest point in the line of cliffs which formed the eastern shore of the lake. A fortification wall, solidly built of roughly squared blocks of stone, encircles the whole edge of the tableland, and is intersected by four gates flanked by towers of massive masonry. Within the fortress are the ruins of other structures, including the remains of a great palace constructed in the style, though not on the plan, of the prehistoric palaces of Mycenae and Tiryns. The fortress and palace of Gla would seem to have been erected in the Mycenaean age by a people akin in civilization, if not in race, to the builders of Tiryns and Mycenae, though

¹ Strabo, ix, 2, 18, p. 407, ed. Casaubon; Pausanias, ix, 24, 2.

² On the Copaic Lake in antiquity see the excellent account in Strabo, ix, 2, 16-18, pp. 406 sq. Compare Pausanias, ix, 24, 1 sq. For modern accounts of it see C. Neumann und J. Partsch, *Physikalische Geographie von Griechenland* (Breslau, 1885), pp. 244-7; and especially A. Philippson, "Der Kopais See in Griechenland und seine Umgebung," *Zeitschrift der Gesellschaft für Erdkunde zu Berlin*, xxix (1894), pp. 1-90. I have allowed myself to quote from the description of the lake in my commentary on Pausanias (vol. v, pp. 110 sqq.), where I have cited the modern literature on the subject.

less skilled in the science of military engineering; for the walls do not exhibit the enormous stones of Tiryns, and the gates are arranged on a plan far less formidable to an assailant than the gates of the two Argive citadels. The scanty remains of pottery and other domestic furniture on the plateau appear to indicate that it was occupied only for a short time, and the traces of fire on the palace point to the conclusion that its end was sudden and violent. Everything within the place bears the imprint of a single plan and a single period: there is no trace of an earlier or a later settlement. Created at a blow, it would seem to have perished at a blow and never to have been inhabited again. In its solitude and silence, remote from all human habitations, looking out from its grey old walls over the vast Copaic plain to the distant mountains which bound the horizon on all sides, this mysterious fortress is certainly one of the most impressive sights in Greece.¹

Can it be that this ancient and forgotten town, once lapped on all sides by the waters of the Copaic Lake, was the home of the legendary Ogyges, and that he forsook it, perhaps in consequence of an inundation, to migrate to the higher and drier site which was afterwards known as Thebes? The hypothesis would go some way to explain the legends which gathered round his memory; but it is no more than a simple guess, and as such I venture to hazard it.

The theory which would explain the great flood of Ogyges by an extraordinary inundation of the Copaic Lake, is to some extent supported by an Arcadian parallel. We have seen that in Greek legend the third great deluge was associated with the name of Dardanus. Now, according to one account, Dardanus at first reigned as a king in Arcadia, but was driven out of the country by a great flood, which submerged the lowlands and rendered them for a long time unfit for cultivation. The inhabitants retreated to the mountains, and for a while made shift to live as best they might on such food as they could procure; but at last, concluding that the land left by the water was not sufficient to support them all, they resolved to part; some of them remained in the country with Dimas, son of Dardanus, for their king; while the rest emigrated under the leadership of Dardanus himself to the island of Samothrace.² According to a Greek tradition, which the Roman Varro accepted, the birthplace of Dardanus was Pheneus in north Arcadia.³ The place is highly significant, for, if we except the Copaic area, no valley in Greece is known to have been from antiquity subject to inundations on so vast a scale and for such long periods as the valley of Pheneus.⁴ The natural conditions in the two regions are substantially alike. Both are basins in a limestone country without any outflow above ground; both receive the rain water which pours into them from the surrounding mountains; both are drained by subterranean channels which the

¹ For a fuller account of the place I may refer the reader to my commentary on Pausanias (vol. v, pp. 120 *sqq.*).

² Dionysius Halicarnasensis, *Antiquitates Romanae*, i, 61.

³ Servius, on Virgil, *Aen.*, iii, 167.

⁴ C. Neumann und J. Partsch, *Physikalische Geographie von Griechenland*, p. 252.

water has worn or which earthquakes have opened through the rock ; and whenever these outlets are silted up or otherwise closed, what at other times is a plain becomes converted for the time being into a lake. But with these substantial resemblances are combined some striking differences between the two landscapes. For while the Copaic basin is a vast stretch of level ground little above sea level and bounded only by low cliffs or gentle slopes, the basin of Pheneus is a narrow upland valley closely shut in on every side by high frowning mountains, their upper slopes clothed with dark pine woods and their lofty summits capped with snow for many months of the year. The river which drains the basin through an underground channel is the Ladon, the most romantically beautiful of all the rivers of Greece. Milton's fancy dwelt on "sanded Ladon's liliated banks"; even the prosaic Pausanias exclaimed that there was no fairer river either in Greece or in foreign lands¹; and among the memories which I brought back from Greece I recall none with more delight than those of the days I spent in tracing the river from its birthplace in the lovely lake, first to its springs on the far side of the mountain, and then down the deep wooded gorge through which it hurries, brawling and tumbling over rocks in sheets of greenish-white foam, to join the sacred Alpheus. Now the passage by which the Ladon makes its way underground from the valley of Pheneus has been from time to time blocked by an earthquake, with the result that the river has ceased to flow. When I was at the springs of the Ladon in 1895, I learned from a peasant on the spot that three years before, after a violent shock of earthquake, the water ceased to run for three hours, the chasm at the bottom of the pool was exposed, and fish were seen lying on the dry ground. After three hours the spring began to flow a little, and three days later there was a loud explosion, and the water burst forth in immense volume. Similar stoppages of the river have been reported both in ancient and modern times ; and whenever the obstruction has been permanent the valley of Pheneus has been occupied by a lake varying in extent and depth in proportion to the more or less complete stoppage of the subterranean outlet. According to Pliny there had been down to his day five changes in the condition of the valley from wet to dry and from dry to wet, all of them caused by earthquakes.² In Plutarch's time the flood rose so high that the whole valley was under water, which pious folk attributed to the somewhat belated wrath of Apollo at Hercules, who had stolen the god's prophetic tripod from Delphi and carried it off to Pheneus about a thousand years before³. However, later in the same century the waters had again subsided, for the Greek traveller Pausanias found the bottom of the valley to be dry land, and knew of the former existence of the lake only by tradition. At the beginning of the nineteenth century the basin was a swampy plain, for the most part covered with fields of wheat or barley. But shortly after the expulsion of the Turks, through neglect of the precautions which the Turkish governor had taken to keep

¹ Pausanias, viii, 25, 13.

² Pliny, *Nat. Hist.*, xxxi, 54.

³ Plutarch, *De sera numinis vindicta*, 12.

the mouth of the subterranean outlet open, the channel became blocked, the water, no longer able to escape, rose in its bed, and by 1830 it formed a deep lake about five miles long by five miles wide. And a broad lake of greenish-blue water it was when I saw it in the autumn of 1895, with the pine-clad mountains descending steeply in rocky declivities or sheer precipices to the water's edge, except for a stretch of level ground on the north, where the luxuriant green of vineyards and maize-fields contrasted pleasingly with the blue of the lake and the sombre green of the pines. The whole scene presented rather the aspect of a Swiss than of a Greek landscape. A few years later and the scene was changed. Looking down into the valley from a pass on a July afternoon, a more recent traveller beheld, instead of an expanse of sea-blue water, a blaze of golden corn with here and there a white point of light showing where a fustanella'd reaper was at his peaceful toil. The lake had disappeared, perhaps for ever; for we are told that measures have now been taken to keep the subterranean outlets permanently open, and so to preserve for the corn the ground which has been won from the water.¹

A permanent mark of the height to which the lake of Pheneus attained in former days and at which, to all appearance, it must have stood for many ages, is engraved on the sides of the mountains which enclose the basin. It is a sharply cut line running round the contour of the mountains at a uniform level of not less than a hundred and fifty feet above the bottom of the valley. The trees and shrubs extend down the steep slopes to this line and there stop abruptly. Below the line the rock is of a light-yellow colour and almost bare of vegetation; above the line the rock is of a much darker colour. The attention of travellers has been drawn to this conspicuous mark from antiquity to the present day. The ancient traveller Pausanias noticed it in the second century of our era, and he took it to indicate the line to which the lake rose at the time of its highest flood, when the city of Pheneus was submerged.² This interpretation has been questioned by some modern writers, but there seems to be little real doubt that the author of the oldest Greek guide-book was substantially right; except that the extremely sharp definition of the line, and its permanence for probably much more than two thousand years, appear to point to a long-continued persistence of the lake at this high level rather than to a mere sudden and temporary rise in a time of inundation. "It is evident," says the judicious traveller Dodwell, "that a temporary inundation could not effect so striking a difference in the superficies of the rock, the colour of which must have been changed from that of the upper parts by the concreting deposit of many ages."³

¹ C. Neumann und J. Partsch, *Physikalische Geographie von Griechenland*, pp. 252 sq.; A. Philippson, *Der Peloponnes* (Berlin, 1892), pp. 144-146; J. ff. Baker-Penoyre, "Pheneus and the Pheneatiké," *Journal of Hellenic Studies*, xxii (1902), pp. 228-240. For further details as to the lake and the river I may refer the reader to my commentary on Pausanias (vol. iv, pp. 230 sqq., 262 sq., 287 sqq.).

² Pausanias, viii, 14, 1.

³ E. Dodwell, *Classical and Topographical Tour through Greece* (London, 1819), ii, 436. This is the view also of the latest writer on the subject, Mr. Baker-Penoyre. See his article,

In a valley which has thus suffered so many alternations between wet and dry, between a broad lake of sea-blue water and broad acres of yellow corn, the traditions of great floods cannot be lightly dismissed; on the contrary, everything combines to confirm their probability. The story, therefore, that Dardanus, a native of Pheneus, was compelled to emigrate by a great inundation which swamped the lowlands, drowned the fields, and drove the inhabitants to the upper slopes of the mountains, may well rest on a solid foundation of fact. And the same may be true of the flood recorded by Pausanias, which rose and submerged the ancient city of Pheneus at the northern end of the lake.¹

From his home in the highlands of Arcadia the emigrant Dardanus is said to have made his way to the island of Samothrace.² According to one account, he floated thither on a raft³; but according to another version of the legend, the great flood overtook him, not in Arcadia, but in Samothrace, and he escaped on an inflated skin, drifting on the face of the waters till he landed on Mount Ida, where he founded Dardania, or Troy.⁴ Certainly, the natives of Samothrace, who were great sticklers for their antiquity, claimed to have had a deluge of their own before any other nation on earth. They said that the sea rose and covered a great part of the flat land in their island, and that the survivors retreated to the lofty mountains which still render Samothrace one of the most conspicuous features in the northern Aegean, and are plainly visible in clear weather from Troy.⁵ As the sea still pursued them in their retreat, they prayed to the gods to deliver them, and on being saved they set up landmarks of their salvation all round the island and built altars on which they continued to sacrifice down to later ages. And many centuries

"Pheneus and the Pheneatiké," *Journal of Hellenic Studies*, xxii (1902), pp. 231 *sqq.* The German geologist, Mr. A. Philippson, took the line to mark the level to which the lake rose in 1830 (*Der Peloponnes*, p. 146). But as the lake suddenly fell again in 1834, it seems hardly possible that a flood lasting for only a few years should have scored its record so deeply on the sides of the mountains. As to the water-line, see further Sir William Gell, *Narrative of a Journey in the Morea* (London, 1823), p. 374; W. M. Leake, *Travels in the Morea* (London, 1830), iii, 147 *sqq.*; E. Pouillon Boblaye, *Recherches Géographiques sur les ruines de la Morée* (Paris, 1835), p. 153, note ²; E. Curtius, *Peloponnesos* (Gotha, 1851), ii, 188 *sq.*; W. G. Clark, *Peloponnesos* (London, 1858), pp. 317 *sq.* The height of the water-line has been variously estimated. Dodwell and Curtius put it at several hundreds of feet; W. G. Clark guessed that it might be about fifty feet above the level of the lake when he saw it. I roughly estimated the line by the eye at 200 or 300 feet above the lake, the level of which was probably lower than at the time of W. G. Clark's visit. Mr. Baker-Penoyre's estimate of the height is 150 feet above the bottom of the valley.

¹ Pausanias, viii, 14, 1.

² Dionysius Halicarnasensis, *Antiquitates Romanae*, i, 61, 3.

³ Scholiast on Plato, *Timaeus*, p. 22A.

⁴ Lycophron, *Cassandra*, 72 *sqq.*, with the scholia of Tzetzes; Scholia on Homer, *Iliad*, xx, 215 (p. 558, ed. Im. Bekker, Berlin, 1825).

⁵ W. Smith, *Dictionary of Greek and Roman Geography*, ii, 901, s.v. "Samothrace." Seen from the neighbouring island of Imbros, the mighty mass of Samothrace rises from the sea like the side of a Norwegian mountain, which indeed it closely resembles when the clouds and mists hang low on it in winter. See Alan G. Ogilvie, "Notes on the Geography of Imbros," *The Geographical Journal*, xlviii (1916), p. 144

after the Great Flood fishermen still occasionally drew up in their nets the stone capitals of columns, which told of cities drowned in the depths of the sea. The causes which the Samothracians alleged for the inundation were very remarkable. The catastrophe happened, according to them, not through a heavy fall of rain, but through a sudden and extraordinary rising of the sea occasioned by the bursting of the barriers which till then had divided the Black Sea from the Mediterranean. At that time the enormous volume of water dammed up behind these barriers broke bounds, and cleaving for itself a passage through the opposing land created the straits which are now known as the Bosphorus and the Dardanelles, through which the waters of the Black Sea have ever since flowed into the Mediterranean. When the tremendous torrent first rushed through the new opening in the dam, it washed over a great part of the coast of Asia, as well as the flat lands of Samothrace.¹

Now this Samothracian tradition is to some extent confirmed by modern geology. "At no very distant period," we are told, "the land of Asia Minor was continuous with that of Europe, across the present site of the Bosphorus, forming a barrier several hundred feet high, which dammed up the waters of the Black Sea. A vast extent of eastern Europe and of western central Asia thus became a huge reservoir, the lowest part of the lip of which was probably situated somewhat more than 200 feet above the sea level, along the present southern watershed of the Obi, which flows into the Arctic Ocean. Into this basin the largest rivers of Europe, such as the Danube and the Volga, and what were then great rivers of Asia, the Oxus and Jaxartes, with all the intermediate affluents, poured their waters. In addition, it received the overflow of Lake Balkash, then much larger, and, probably, that of the inland sea of Mongolia. At that time the level of the Sea of Aral stood at least 60 feet higher than it does at present. Instead of the separate Black, Caspian, and Aral seas, there was one vast Ponto-Aralian Mediterranean, which must have been prolonged into arms and fiords along the lower valleys of the Danube and the Volga (in the course of which Caspian shells are now found as far as the Kama), the Ural, and the other affluent rivers—while it seems to have sent its overflow northward, through the present basin of the Obi."² This enormous reservoir, or vast inland sea, pent in and held up by a high natural dam joining Asia Minor to the Balkan Peninsula, appears to have existed down to the Pleistocene Period; and the erosion of the Dardanelles, by which the pent-up waters at last found their way into the Mediterranean, is believed to have taken place towards the end of the Pleistocene Period or later.³ But man is now known for certain to have inhabited Europe in the Pleistocene Period; some hold that he

¹ Diodorus Siculus, v, 47. Among the proofs of the great antiquity of the Samothracians, according to this historian, was their archaic dialect, of which many examples survived in their religious ritual down to his time.

² T. H. Huxley, "The Aryan Question," *Collected Essays*, vol. vii (London, 1906), pp. 300 *sq.*

³ T. H. Huxley, "Hasisadra's Adventure," *Collected Essays*, vol. iv (London, 1911), pp. 275, 276.

inhabited it in the Pliocene or even the Miocene Period.¹ Hence it seems possible that the inhabitants of Eastern Europe should have preserved a traditional memory of the vast inland Ponto-Aralian Sea, and of its partial desiccation through the piercing of the dam which divided it from the Mediterranean—in other words, through the opening of the Bosphorus and the Dardanelles. If that were so, the Samothracian tradition might be allowed to contain a large element of historical truth in regard to the causes assigned for the catastrophe. On the other hand geology seems to lend no support to the tradition of the catastrophe itself. For the evidence tends to prove that the strait of the Dardanelles was not opened suddenly, like the bursting of a dam, either by the pressure of the water or the shock of an earthquake, but that on the contrary it was created gradually by a slow process of erosion which must have lasted for many centuries or even thousands of years; for the strait “is bounded by undisturbed Pleistocene strata forty feet thick, through which, to all appearances, the present passage has been quietly cut.”² Thus the lowering of the level of the Ponto-Aralian Sea to that of the Mediterranean can hardly have been sudden and catastrophic, accompanied by a vast inundation of the Asiatic and European coasts; more probably it was effected so slowly and gradually that the total amount accomplished in a generation would be imperceptible to ordinary observers, or even to close observers unprovided with instruments of precision. Hence, instead of assuming that Samothracian tradition preserved a real memory of a widespread inundation consequent on the opening of the Dardanelles, it seems safer to suppose that this story of a great flood is nothing but the guess of some early philosopher, who rightly divined the origin of the straits without being able to picture to himself the extreme slowness of the process by which nature had excavated them. As a matter of fact, the eminent physical philosopher Strabo, who succeeded Theophrastus as head of the Peripatetic School in 287 B.C., actually maintained this view on purely theoretical grounds, not alleging it as a tradition which had been handed down from antiquity, but arguing in its favour from his observations of the natural features of the Black Sea. He pointed to the vast quantities of mud annually washed down by great rivers into the Euxine, and he inferred that but for the outlet of the

¹ Sir Charles Lyell, *The Student's Elements of Geology*, Third Edition (London, 1878), pp. 128 *sqq.*; A. de Quatrefages, *The Human Species* (London, 1879), pp. 142–53; Sir John Lubbock (Lord Avebury), *Prehistoric Times*, Fifth Edition (London and Edinburgh, 1890), pp. 422 *sqq.*; W. J. Sollas, *Ancient Hunters* (London, 1915), pp. 59–86. None of these writers definitely assents to the view that man existed in the Pliocene or even Miocene Period. Sir John Lubbock (Lord Avebury) expresses himself doubtfully on the point. Professor Sollas sums up his conclusion (p. 85) as follows: “We have seen that the order of succession in time of fossil remains of the Mammalia and especially of apes and men suggests that man, in the strictest sense, *Homo sapiens*, is a creature of Pleistocene time; as we look backwards into the past we lose sight of him before the close of that age and encounter in his place forms specifically and even generically distinct; that other species of the human family might have already come into existence in the Pliocene epoch seems possible, but scarcely in the Miocene, and still less in the Oligocene epoch.”

² T. H. Huxley, “Hasisadra's Adventure.” *Collected Essays*, vol. iv (London, 1911), p. 281.

Bosphorus the basin of that sea would in time be silted up. Further, he conjectured that in former times the same rivers had forced for themselves a passage through the Bosphorus, allowing their collected waters to escape first to the Propontis and then from it through the Dardanelles to the Mediterranean. Similarly he thought that the Mediterranean had been of old an inland sea, and that its junction with the Atlantic was effected by the dammed-up water cutting for itself an opening through the Straits of Gibraltar.¹ Accordingly we may conclude that the cause which the Samothracians alleged for the Great Flood was derived from an ingenious speculation rather than from an ancient tradition.

There are some grounds for thinking that the flood story which the Greeks associated with the names of Deucalion and Pyrrha may in like manner have been, not so much a reminiscence of a real event, as an inference founded on the observation of certain physical facts. We have seen that in one account the mountains of Thessaly are said to have been parted by the deluge in Deucalion's time, and that in another account the ark, with Deucalion in it, is reported to have drifted to Mount Othrys in Thessaly. These references seem to indicate Thessaly as the original seat of the legend; and the indication is greatly strengthened by the view which the ancients took of the causes that had moulded the natural features of the country. Thus Herodotus relates a tradition that in ancient times Thessaly was a great lake or inland sea, shut in on all sides by the lofty mountains of Ossa and Pelion, Olympus, Pindus, and Othrys, through which there was as yet no opening to allow the pent-up waters of the rivers to escape. Afterwards, according to the Thessalians, the sea-god Poseidon, who causes earthquakes, made an outlet for the lake through the mountains by cleaving the narrow gorge of Tempe, through which the River Peneus has ever since drained the Thessalian plain. The pious historian intimates his belief in the truth of this local tradition. "Whoever believes," says he, "that Poseidon shakes the earth, and that chasms caused by earthquakes are his handiwork, would say, on seeing the gorge of the Peneus, that Poseidon had made it. For the separation of the mountains, it seems to me, is certainly the effect of an earthquake."² The view of the father of history was substantially accepted by later writers of antiquity,³ though one of them would attribute the creation of the gorge and the drainage of the lake to the hero Hercules, among whose beneficent labours for the good of mankind the construction of waterworks on a gigantic scale was commonly reckoned.⁴ More cautious or more philosophical authors contented themselves with referring the origin of the defile to a simple earthquake, without expressing any opinion as to the god or hero who may have set the tremendous disturbance in motion.⁵

¹ Strabo, i, 3, 4, pp. 49-50, ed. Casaubon. Compare Sir Charles Lyell, *Principles of Geology*,¹² (London, 1875), i, 24; E. H. Bunbury, *History of Ancient Geography*² (London, 1883), i, 658 sq.

² Herodotus, vii, 129.

³ Philostratus, *Imag.*, ii, 14.

⁴ Diodorus Siculus, iv, 18, 6.

⁵ Strabo, ix, 5, 2, p. 430, ed. Casaubon; Seneca, *Natur. Quaest.*, vi, 25, 2.

Yet we need not wonder that popular opinion in this matter should incline to the theory of divine or heroic agency, for in truth the natural features of the pass of Tempe are well fitted to impress the mind with a religious awe, with a sense of vast primordial forces which by the gigantic scale of their operations present an overwhelming contrast to the puny labours of man. The traveller who descends at morning into the deep gorge from the west may see, far above him, the snows of Olympus flushed with a golden glow under the beams of the rising sun, but as he pursues the path downwards the summits of the mountains disappear from view, and he is confronted on either hand only by a stupendous wall of mighty precipices shooting up in prodigious grandeur and approaching each other in some places so near that they almost seem to meet, barely leaving room for the road and river at their foot, and for a strip of blue sky overhead. The cliffs on the side of Olympus, which the traveller has constantly before his eyes, since the road runs on the south or right bank of the river, are indeed the most magnificent and striking in Greece, and in rainy weather they are rendered still more impressive by the waterfalls that pour down their sides to swell the smooth and steady current of the stream. The grandeur of the scenery culminates about the middle of the pass, where an enormous crag rears its colossal form in air, its soaring summit crowned with the ruins of a Roman castle. Yet the sublimity of the landscape is tempered and softened by the richness and verdure of the vegetation. In some parts of the defile the cliffs recede sufficiently to leave little grassy flats at their foot, where thickets of evergreens—the laurel, the myrtle, the wild olive, the arbutus, the *Agnus castus*—are festooned with wild vines and ivy, and variegated with the crimson bloom of the oleander and the yellow gold of the jasmine and laburnum, while the air is perfumed by the luscious odours of masses of aromatic plants and flowers. Even in the narrowest places the river bank is overshadowed by spreading plane-trees, which stretch their roots and dip their pendent boughs into the stream, their dense foliage forming so thick a screen as almost to shut out the sun. The scarred and fissured fronts of the huge cliffs themselves are tufted with dwarf oaks and shrubs, wherever these can find a footing, their verdure contrasting vividly with the bare white face of the limestone rock; while occasional breaks in the mountain wall open up vistas of forests of great oaks and dark firs mantling the steep declivities. The overarching shade and soft luxuriance of the vegetation strike the traveller all the more by contrast if he comes to the glen in hot summer weather after toiling through the dusty, sultry plains of Thessaly, without a tree to protect him from the fierce rays of the southern sun, without a breeze to cool his brow, and with little variety of hill and dale to relieve the dull monotony of the landscape.¹ No wonder that speculation should have early busied itself with

¹ E. Dodwell, *Classical and Topographical Tour through Greece* (London, 1819), ii, 109 *sqq.*; Sir William Gell, *The Itinerary of Greece* (London, 1819), pp. 275 *sqq.*; W. M. Leake, *Travels in Northern Greece* (London, 1835), iii, 390 *sqq.*; C. Bursian, *Geographie von Griechenland* (Leipzig, 1862–72), i, 58 *sqq.*; Christopher Wordsworth, *Greece, Pictorial, Descriptive, and Historical*, New Edition revised by H. F. Tozer (London, 1882), pp. 295 *sqq.* For ancient

the origin of this grand and beautiful ravine, and that primitive religion and science alike should have ascribed it to some great primeval cataclysm, some sudden and tremendous outburst of volcanic energy, rather than to its true cause, the gradual and age-long erosion of water.¹

Hence we may with some confidence conclude that the cleft in the Thessalian mountains, which is said to have been rent by Deucalion's flood, was no other than the gorge of Tempe. Indeed, without being very rash, we may perhaps go further and conjecture that the story of the flood itself was suggested by the desire to explain the origin of the deep and narrow defile. For once men had pictured to themselves a great lake dammed in by the circle of the Thessalian mountains, the thought would naturally occur to them, what a vast inundation must have followed the bursting of the dam, when the released water, rushing in a torrent through the newly opened sluice, swept over the subjacent lowlands carrying havoc and devastation in its train! If there is any truth in this conjecture, the Thessalian story of Deucalion's flood and the Samothracian story of the flood of Dardanus stood exactly on the same footing: both were mere inferences drawn from the facts of physical geography: neither of them contained any reminiscences of actual events. In short, both were what Sir Edward Tylor has called myths of observation rather than historical traditions.² Thus they differ from the Semitic story of a great flood, which appears to embody, in an exaggerated form, the recollection of a real catastrophe which once laid a large part of the lower valley of the Euphrates under water. To sum up, the difference between the Semitic and the Greek traditions is the difference between a legend and a myth.

descriptions of Tempe, see Aelian, *Var. Hist.*, iii, 1; Livy, xliv, 6; Pliny, *Nat. Hist.*, iv, 31; Catullus, lxiv, 285 *sqq.*; Ovid, *Metamorph.*, i, 568 *sqq.* Of these descriptions that of Aelian is the most copious and most warmly coloured. He dwells with particular delight on the luxuriance of the vegetation.

¹ "That Olympus and Ossa were torn asunder and the waters of the Thessalian basin poured forth, is a very ancient notion and an often-cited 'confirmation' of Deucalion's flood. It has not yet ceased to be in vogue, apparently because those who entertain it are not aware that modern geological investigation has conclusively proved that the gorge of the Peneus is as typical an example of a valley of erosion as any to be seen in Auvergne or in Colorado" (T. H. Huxley, "Hasisadra's Adventure," *Collected Essays*, vol. iv, pp. 281 *sq.*).

² (Sir) Edward B. Tylor, *Researches into the Early History of Mankind* (London, 1878), pp. 306 *sqq.*

STUDIES IN PRIMITIVE LOOMS.

[WITH PLATE XII.]

By H. LING ROTH.

I.

1.—INTRODUCTION AND DEFINITION OF TERMS.

A GREAT deal has been written about primitive weaving tools, and if I add to the quantum it is partly because I venture to think I have something new to say, and partly because I wish to bring to the notice of travellers and students at home and abroad the necessity for gathering further, and above all correct, information on the subject before it is too late. There is nothing so annoying as the crude descriptions we are supplied with, when a little care could and should bring us invaluable knowledge ; and as to the illustrations, the authors seem to hide just that which is the most important for us to see. Here in England, in the greatest textile-producing country in the world, we still evince little interest in the subject. Quite recently the publishers of the *History of the Nations* illustrated an impossible loom which they depict as coming from Babylonia—an absolute and deliberate piece of fiction which could not have been foisted on the public if it had known something definite about primitive looms.

Weaving is generally considered to be the outcome of basketry and mat-making, and in most cases probably it is so. It consists of the interlacing at right angles by one series of filaments or threads, known as the *weft* (or *woof*) of another series, known as the *warp*, both being in the same plane.

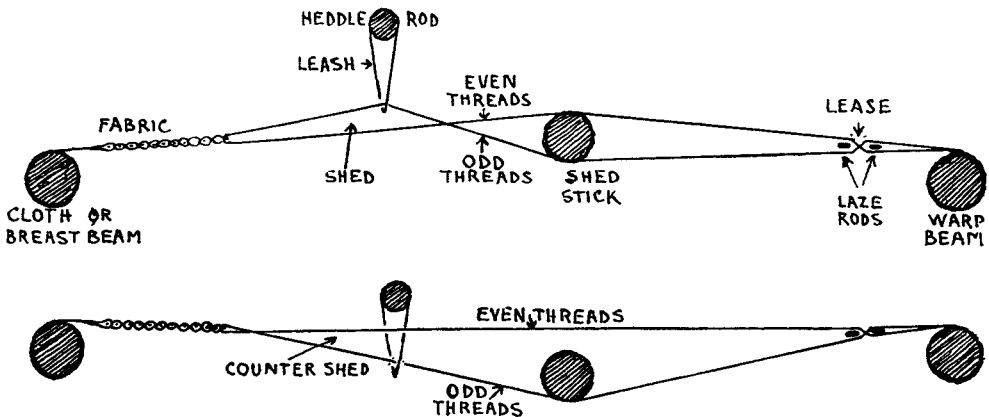


FIG 1. DIAGRAM TO ILLUSTRATE THE PRINCIPLES OF WEAVING

The warp threads are stretched side by side from a *cloth*, or *breast-beam*, to another beam known as the *warp-beam*, often spoken of as *the beam*, and the weaving is encompassed as follows (see Fig. 1): The *odd threads* (1, 3, 5, 7, 9, etc.) are raised by means of the fingers, leaving the *even threads* (2, 4, 6, 8, 10, etc.) in position. By raising the odd threads only, a space or opening is formed between the two sets of threads, which is called the *shed*. Through this shed the weft thread is passed, or, as it is termed, a *pick*, or *shot*, is made. This weft thread (or pick) is straightened and pressed home into position at right angles to the warp by means of a *sword*, or *beater-in*. The odd threads are then dropped back into position, and the even threads are now raised instead, whereby a new or *countershed* is produced and the pick made as before. It will be understood that, as a consequence of the lifting and dropping of the odd and even threads, these two sets of threads cross each other, but remain in their respective vertical planes. This crossing keeps the pick in position.

To make the work easier and more expeditious a rod, the *heddle*- or *heald-rod*, is placed across the warp; to this rod the odd warp threads are lightly attached by a series of *loops* or *leashes*, so that when the rod is raised all the odd threads are raised *together* instead of singly by the fingers, and through the shed so formed the pick is made. When the rod is dropped, the odd threads fall back into position between the even threads. But as the even threads are now not raised, the odd threads must be made to fall below the even threads to make the next or countershed. The odd threads are therefore pulled down once over by the fingers, and in the countershed so made a thick rod or *shed-stick* is inserted. This shed-stick remains in this position until the whole warp is used up, or, in other words, the piece of cloth is woven, and its action may be described as follows: When the heddle is raised, the pick made, and the heddle dropped again, the shed-stick, owing to its thickness, forces the odd threads below the even threads, and so the countershed is obtained. Later on a flat stick has come into use, which is kept flat to the warp when the heddle is raised, but set on edge when the heddle is dropped, whereby the shed is enlarged and the pick facilitated. Later still, double heddles and counter heddles, with their *harness* and *treadles*, were introduced, but these can be dealt with as they arise.

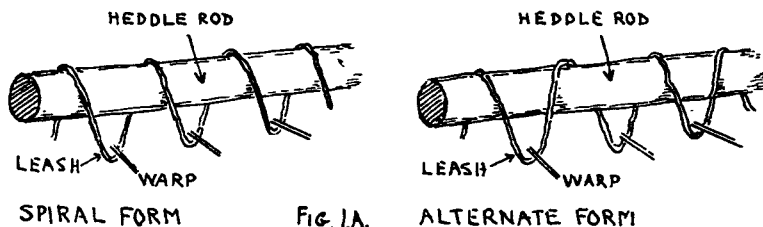


FIG. 1A. ALTERNATE FORM

The heddle leashes are either single or continuous. If single (that is, if every leash is made of a separate piece of filament, spun or non-spun), the leashes are often bunched together, as in the African raphia looms, or every leash is tied up

separately, as in more advanced looms. If continuous (that is, one long filament serves for making all the leashes required), then the leashes are either *spiral* or *alternate*, as shown in the illustration Fig. 1A. "Spiral" means that the filament is wound loosely round the heddle-stick, and "alternate" means that the filament laps over the sides of the heddle-rod alternately.

The difficulty experienced in keeping the warp threads from getting entangled one with another, especially when these threads are long and the cloth to be woven is broad, is overcome by crossing them with one or two pairs of rods. The odd threads (more or less close to the warp beam) are raised, and one rod passed through the shed; then the even threads are raised and the other rod passed through. This arrangement causes friction, and the warp threads are unable to move laterally, and hence retain their position and do not tangle. This crossing of the warps is called a *lease*, and hence the rods are called the *lease-rods*, corrupted into *laze-rods*. Laze-rods are, in so far as my studies go, found at the present day on nearly all primitive looms, although in the quite early stages the warps are more or less bunched at the lease, and do not require any laze-rods.

Another method of keeping the warp threads in position is the *warp-spacer*, known also as a *raddle*. It appears to have been in use in Egypt.¹ It is provided with pegs or teeth, between which the warp threads are passed in various definite quantities. The space *between* the teeth or pegs is called a *dent* by weavers, although the loom-makers call the tooth or peg the dent; as we are dealing with weaving and not with machine-making, it will be as well to adhere to the users' definition.

In course of time the beater-in was supplanted by a comb-like article which developed into the *reed* and later still into the *sley*, a tool which drives home the weft as well as keeps the warp in position. I say "supplanted" advisedly, as so far I cannot trace any evolution in the matter, and, judging by specimens of reeds from the Philippines and Borneo, the reed was originally a form of warp-spacer, and ultimately became a beater-in as well. But in any case the reed appears to have made its appearance very late.

There is a third method which consists in fixing the warp threads separately on the beams by means of a heading or tailing thread, but this is only effective on short looms.

Now as to the meaning of the word *loom*. According to the *New Oxford Dictionary* it is of obscure origin, and meant in the first instance "an implement or tool of any kind," now applied to "a machine in which yarn or thread is woven into fabric by the crossing of threads called respectively the warp and weft." Some writers only apply the term loom to the frame when it refers to weaving in which the shed is no longer obtained by means of the fingers (or a pointed stick or a spool point), but by mechanical means, viz., the heddle. But I think that as long as a fabric, *i.e.*, anything woven in the accepted signification of the term, is obtained,

¹ See *Ancient Egyptian and Greek Looms*, by H. Ling Roth, Halifax, 1913, p. 20.

the frame on which it is obtained had better be called a loom, and in that sense I use it in these studies.

2.—THE EVOLUTION OF THE SPOOL AND SHUTTLE.

There seems some confusion as to what is a spool or bobbin, and as to what is a shuttle, nor is it at first sight quite easy to draw a hard and fast line. I should describe a spool or bobbin as a quill or small cylindrical shaft on which the weft is wound for the purpose of weaving, and a shuttle as an instrument for the same purpose, consisting ultimately of a more or less boat-shaped *case containing a spool*. In the accompanying diagram (Fig. 2) I have made an attempt to portray the evolution of both from a single short filament. The lines of evolution seem to be three :

- (A) One in which the filament is wound round the spool more or less lengthwise, *i.e.*, parallel to the axis of the spool ;
- (B) the other in which the filament is wound more or less at right angles to the axis of the spool ; and
- (C) the third, in which the attachment can be likened to the threading of a needle, as in the Iceland specimen, or where instead of a needle eye there is a slot, as in the African beater-in and spool combined. As regards this African tool, the slot points away from the body or blunt end of the tool, hence it would appear that it is pushed through the shed, and when it emerges at the other side the filament is put into the slot and the spool withdrawn the way it entered, leaving the filament in its place. There are some more advanced forms of the African beater-in and spool combined, which have the slot pointing both ways.

Evolution along the line *A* : From winding the weft lengthwise and covering the spool almost to its very ends, which are rounded or cut off straight at first, we find the ends become grooved as in the Slave Indian specimen *Ab*, and gradually as the grooves deepen the now double ends appear to lengthen, *Ab1*, and take the shape of horns as with the Ainu spool *Ab2* ; then these double ends incline towards each other like those of our fishermen's mesh-pin or needle, and finally recurve backwards as in the second Ainu example *Ab3*.

At the same time as a branch development the rounded sides of the spool become flattened and in turn become grooved so that there is a longitudinal groove as well as an end one, that is to say, the groove is continuous ; this is seen in the Santa Cruz specimen *Ad1*, and still more so in the Iban specimen *Ad2*, which is practically the same, only on a larger scale, as our well-known English ladies' tatting shuttle, so called.

On the line of evolution *B* with its transverse winding at right angles to the spool, the resultant bulginess attained by this method of winding may have necessitated a cover or case to facilitate the making of the pick. As a first form of such a case we have in the Malay specimen *Bb* a piece of cane cut off at a node

DIAGRAM
TO ILLUSTRATE THE
EVOLUTION
OF THE
SPOOL AND SHUTTLE.

H. LING ROTH.

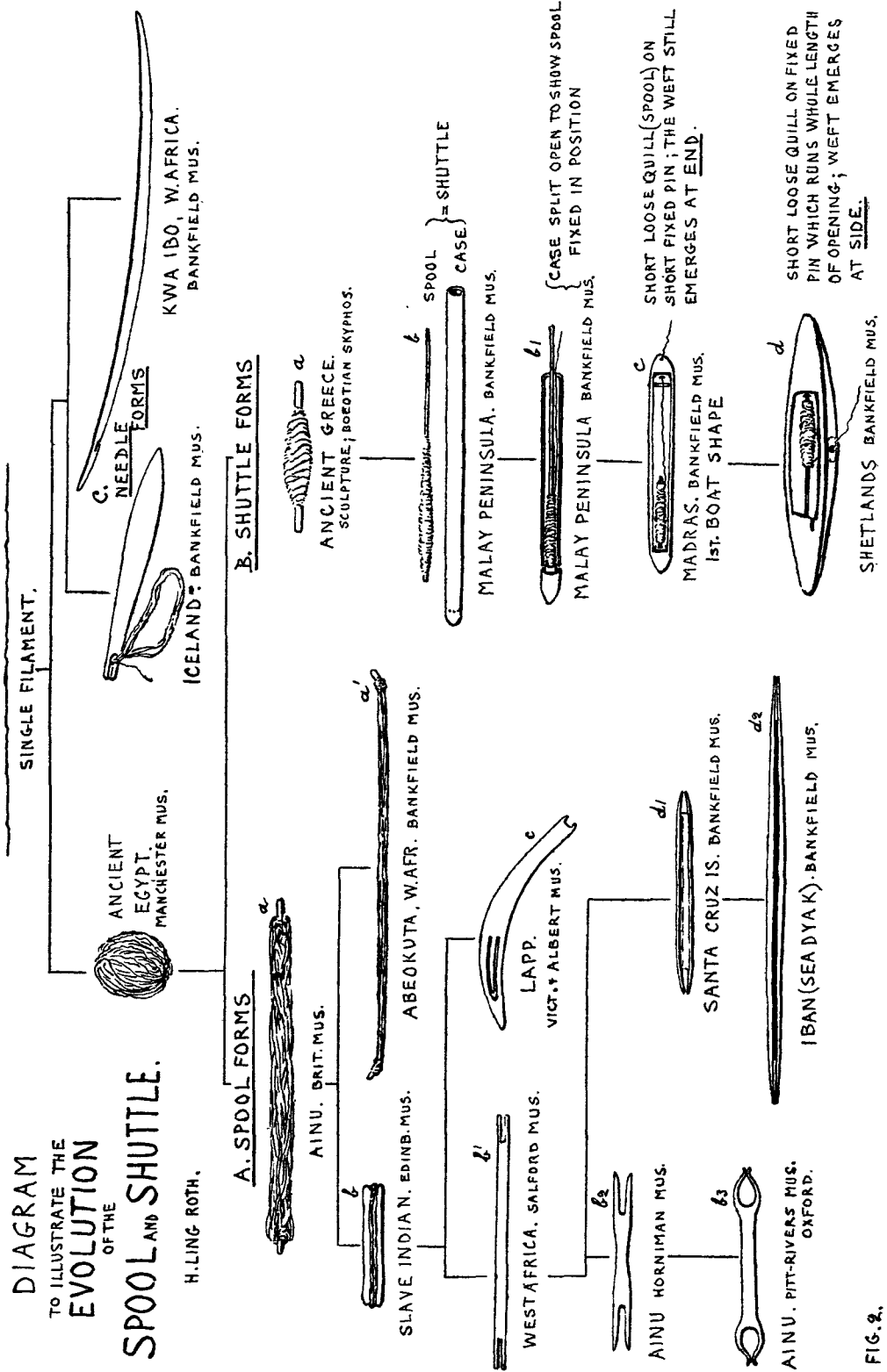


FIG. 2.

which has been slightly rounded. In this the spool is placed, not fixed, and the weft unravels from the open end. A development of this consists in making the blunt end pointed, or making a point of gum or of some other resinous substance, as in another Malay specimen not shown. Later on this point is replaced by a wooden stopper with an internal socket, into which the spool is rammed, and so gets fixed as in a third Malay specimen *Bb1*. Then to ease the unravelling in the tube the spool is shortened, for the case is now held by the hand instead of the spool being held, and further to assist supervision the upper longitudinal half of the cane case appears to have been cut away, the end plugged and perforated, to guide the outgoing weft, and we get the first shuttle as known to us in the boat form with the weft still running out endwise as in the Madras specimen *Bc*. There is, however, an objection to the end outlet, inasmuch as a shuttle so provided has to be turned round at the end of every pick, hence the outlet for the weft was made at the side instead, while the spool was made to fit the full length of the case opening in the shuttle *Bd*, and this is the general form the shuttle practically retains at the present day.

The longitudinal method of winding the thread on the bobbin, *i.e.*, method *A*, is evidently due to the fact that owing to its slender shape the spool passes easily through the shed. On the other hand, the thickness resulting with method *B* makes the pick more difficult, a difficulty which was overcome by the use of a case, the adoption of which was facilitated by the shortening of the spool.

In order to test this I had a wooden spool made 22 inches (or 56 cm.) long and $\frac{9}{16}$ inch (or 14 mm.) in diameter, and had it carefully wound round with 200 yards of thread according to method *A*; this covered the spool to a length of 21 inches (or 53 cm.), and increased its diameter to $\frac{3}{4}$ inch (or 19 mm.). Then another spool of wood was obtained $8\frac{1}{2}$ inches (or 21 cm.) long, and also $\frac{9}{16}$ inch (or 14 mm.) in diameter; 200 yards of the same thread was wound round this according to method *B*, covering the spool to a length of $3\frac{1}{2}$ inches (or 8.9 cm.), and increasing its diameter to $1\frac{3}{8}$ inches (or 35 mm.). It is therefore evident that by the method *A* the same quantity of thread can be carried through a small shed with greater ease than can be carried through by method *B*. In connection with this I find also, generally speaking, the method *A*, the longitudinal method, is in use only with the more primitive forms of loom, *i.e.*, those in which the countershed is still made by a shed stick, and where consequently the shed is not so clear, nor opened so widely, as in looms provided with counter heddles and treadles. In other words, the improvement in the loom permitted improvement in the spool, which led to the evolution of the shuttle.

According to the explanation given in the *New Oxford Dictionary*, the origin of the word bobbin is unknown, but we are informed that Cotgreve, writing in 1611, calls it "a quill for a spinning wheele." The word spool is merely another term for bobbin, is of Teutonic origin, and is also applied "to the mesh-pin used in net-weaving." As regards the word shuttle, the same dictionary tells us that primarily it meant a "dart, missile, arrow," an explanation which appears to me to

designate correctly the quality which distinguishes it from the spool, for I have found it easier to shoot through a shed with a shuttle than with a spool. It was no doubt this shooting capacity which led Kaye to invent the flying shuttle in 1733.

To come back to the Dictionary, we find it says: "The normal form of the shuttle resembles that of a boat, whence its name in various languages (L. *navicula*, F. *navette*, G. *Webeschiff*)."¹ As regards the French and German interpretations the Dictionary is most probably correct, but not so as regards the Latin interpretation. Asking Professor T. F. Tout, Manchester University, for assistance in the explanation of the extended meaning of the word *navicula*, he kindly replied, saying, "*Radius* and *pecten* are the ordinary classical words for shuttle," and quoted the well-known lines in Virgil: *Arguto tennes percurrrens pectine telas* (as she runs over her delicate web with the nimble spool), *Æn.*, VII, 14. He continued, "The ordinary dictionaries, e.g., Lewis and Short, do not give *navicula* in the sense of shuttle at all. Ducange, s.v. *navicula*, quotes Ugotio (a twelfth-century writer, I think), *Radius instrumentum texendi, scilicet pecten vel navicula* (Bobbin, an instrument for weaving, that is a quill or shuttle), a good passage for your purpose. The French *navette* is also used in the thirteenth century in its modern sense of shuttle. This is as far back as my reference books give the word. If one had time, no doubt earlier instances could be found, but *navicula* is certainly post-classical for shuttle, though probably earlier than the twelfth century. This helps your point that early shuttles were not like little boats."

Blümner, in his great work,¹ after describing *κερκis* (spool), as used by the Greeks, continues: "But, apart from this, Homeric times seem to have known the real shuttle, in which the weft is wound round a spool inside and unravels through an opening in the shuttle when it is thrown. In the above-mentioned passage in Homer—viz., *Iliad*, XXII, 760—it is stated of the female weaver: *πηνίον ἐξέλκουσα παρέκ μίτον* (drawing the spool across the web); here *πηνίον* takes the place of *κερκis*. This *πηνίον* we also meet with elsewhere, yet it cannot be considered identical with *κερκis*, but is explained by acknowledging that the spool within the shuttle is referred to." But why? I ask. The passage is clear enough without such an inference. Blümner then quotes various forms of *πηνίον* and its application, but there is not in any one of his quotations any description which can in the remotest way be applied to a shuttle. He also quotes in support of his contention the well-known post-classical fourth century A.D. lexicographer Hesychius, who most probably had seen a shuttle at the time of his writing; but while this authority does distinguish between the spool and the shuttle, this does not prove the existence of the shuttle some 1100 or 1200 years before his time. Marquardt² says *πηνίον* is the weft (the *Eintragfaden*), and this fits the passage well enough, "drawing the weft across the web"; spool and weft are equally correct. It seems as

¹ *Techn. u. Term. der Gewerbe u. Kuenste bei Griechen u. Roemern*, 1st vol., 2nd ed., Leipzig, 1912, pp. 152-3.

² *Das Privatleben der Roemer*, Leipzig, 1879, p. 504, note 7.

though Blümner, having given his opinion that in Homer's time the shuttle was known, is attempting to give a new reading to the word *πηνίον* in order to sustain his contention. He is, however, misled by an illustration (the bottom central one of Fig. 160 on p. 157 of the *British Museum Guide to the Exhibition illustrating Greek and Roman Life*, which he takes to be a shuttle (*Webeschiffchen*), but which is in reality the grooved spool of type *Ad1* of my diagram, and most decidedly *not* a shuttle.

The noise made by the shuttle and referred to in the classics is also brought in as a proof of the existence of the tool at the period named. A purposely obscure passage in Aristophanes' *Frogs*, 1316, quoted by Marquardt, p. 509, note, reads:—

*ἰστότονα πηνισματα
κερκίδος ἀοιδοῦ μελέτας,*

“the weft stretched on the web beam—the care of the tuneful shuttle.” What is a tuneful shuttle? And in the quoted passage from the *Æneid* we are treated to the “singing” of the shuttle. In this case we have an alternative for *arguto* (singing), by translating it “deft” or “nimble,” and it would appear that if “nimbleness” be accepted, it must be on account of poetical licence—and we are dealing with poets—in which the deftness of the weaver is transferred to her implement. On the other hand, there appears no other meaning for *ἀοιδός* than “tuneful,” and with regard to the low state of musical culture among the Greeks, what may have been tuneful to them is most probably not tuneful to us. The fact is, a noise was made during weaving and recorded, the recorder not being very precise as to whether the noise emanated from the tool which set the work in motion or from the loom. I have ascertained by experiment on various more or less primitive looms in Bankfield Museum, that some shuttles make no noise, while others do, and that, generally speaking, whether spools or shuttles are used, the noise the observer notes comes from the loom itself and not from the shuttle.

In their earlier periods the Greeks had vertical looms with warp weights, which possibly in later times were replaced by a lower or breast beam. As explained above, the shuttle evolved with the improvements of the loom. It evolved as other things evolve, as the opportunity or necessity for it arose. There was little opportunity, if any, and practically no necessity, for the shuttle on the warp-weighted loom of so primitive a construction as that possessed by the earlier Greeks. Hence, taking all the points into consideration, it appears to be an anachronism to infer that the shuttle existed in Homeric, or perhaps even in later Greek, times. What was used was still a spool.¹

¹ Since the above was written I find that Otto Schrader (*Lingu.-hist. Forschungen zur Handelsgeschichte u. Warenkunde*, Jena, 1886, p. 182), as quoted by Franz Stuhlmann (*Ein Kulturgeschichtlicher Ausflug in den Aures* . . . Hamburg, 1912, p. 195), states: “Our shuttle was unknown to the Ancients.” I have not been able to see a copy of Schrader's work.

3.—THE AINU LOOM.

The Ainu loom is a primitive affair, with characteristics well worth studying. It has not been described before to any extent except in a very crude and unsatisfactory way by Hugo Ephraim,¹ and hence I have chosen it as a fit subject for discussion.



FIG. 3.—AINU WOMAN WEAVING.
(After Romyn Hitchcock.)



FIG. 4.—AINU WOMAN WEAVING.
(As reproduced by Ephraim, after Romyn Hitchcock. Note the distorted heddle and spool, and the gratuitous and incorrect addition of the feet.)

Both reduced by one-fourth lineal.

We are told by the Rev. John Batchelor that "the chief article of dress worn by the Ainu is a long garment which they call *attush*. This word really means elm fibre or elm thread, and, as the words indicate, the dresses are made from the inner bark of elm-trees. Such garments are very brittle when dry, but when wet they are exceedingly strong.² According to MacRitchie, in the legend descriptive of the illustration of Ainu peeling the bark off the tree, it is "*Microptelea parvifolia*, in Aino *ohiyo*," but Hitchcock says the people use the bark of the elm (*Ulmus montana*), called by them *ohiyo*, and sometimes *U. campestris*.³ Batchelor continues: "Elm bark is peeled off the trees in early spring or autumn, just when the sap commences to flow upwards or when it has finished doing so.⁴ When sufficient bark has been taken, it is carried home and put into warm, stagnant water to soak. It remains here for about ten days till it has become soft; then, when it has become sufficiently soaked, it is taken out of the water, the layers of bark separated, dried in the sun, and the fibres divided into threads and wound up into

¹ "Ueber die Entwicklung der Webetechnik . . ." (*Mitt. a. d. städ. Mus. f. Voelkerk. zu Leipzig*, 1905).

² *The Ainu and their Folklore*, Lond., 1901, 2nd ed., p. 144.

³ "The Ainos of Yezo," *Rep. U.S. Nat. Mus.* for 1890, p. 463.

⁴ "The men bring in the bark, in strips 5 feet long, having removed the outer coating" (Bird).

balls for future use. Sewing-thread is sometimes made in the same way, only it is chewed till it becomes round and solid. Sometimes, however, thread is made by chewing the green fibre as soon as taken from the trees. When all the threads have been prepared, the women sit down and proceed with their weaving."

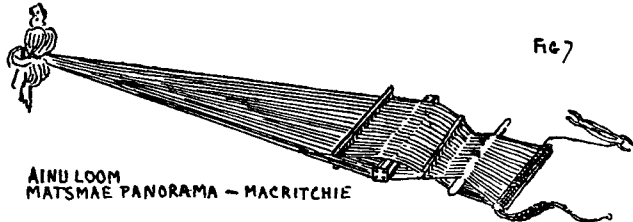
Going a little more into detail, Miss Bird says: "This inner bark is easily separated into several thin layers, which are split into very narrow strips by the older women, very neatly knotted, and wound into balls weighing about a pound



AINU STRIPPING BARK OFF ELMS. •
YEZO-MANGA PICTURES—MACRITCHIE



AINU WEAVING. YEZO-MANGA PICTURES—MACRITCHIE



AINU LOOM
MATSMAE PANORAMA—MACRITCHIE

each. . . . The loom consists of a stout hook fixed in the floor, to which the threads of the far end of the web are secured, a cord fastening the near end to the waist of the worker,¹ who supplies, by dexterous rigidity, the necessary tension; a frame like a comb resting on the ankles, through which the threads pass; a hollow roll for keeping the upper and under threads separate, and spatula-shaped beater-in² of engraved wood, and a roller on which the cloth is rolled as it is made. The length of the web is 15 feet, and the width of the cloth 15 inches. It is woven with great regularity, and the knots in the thread are carefully kept on the underside. It is a very slow and fatiguing process, and a woman cannot do much more than a foot (30 cm.) a day. The weaver sits on the floor with the whole arrangement attached to her waist, and the loom, if such it can be called, on her ankles. It takes long practice before she can supply the necessary tension by spinal rigidity. As the work proceeds, she drags herself almost imperceptibly nearer the hook. In this house and other large ones two or three women bring in their webs in the morning, fix their hooks, and weave all day, while others, who have not equal advantages, put their hooks in the ground and weave in the sunshine. The web and loom can be bundled up in two minutes, and carried away quite as easily as a knitted sofa

¹ This is the semi-girdle or backband. A. S. Bickmore (*Trans. Ethnol. Soc.*, vii, N.S., 1869, p. 18) speaks of it as a board. If so it is somewhat similar to the old-fashioned Japanese back-piece.

² Bird uses the word "shuttle" here, but it is evidently a clerical error.

blanket.¹ Batchelor tells us the garments produced "are very rough indeed, reminding one of sackcloth, and are of a dirty brown colour. It is therefore no wonder that those Ainu who can afford it prefer to wear the softer Japanese clothing."

Simple as it looks, the Ainu loom is characteristic in all its parts except one, and this one, the semi-girdle or back-strap, appears to connect it with the looms of, generally speaking, the Pacific Region. The users of the back-strap are, or were, the Bhutiyas of N.W. India (specimen in Bankfield Museum), the Tibetans,² the Chinese,³ Burmese and Assamese,⁴ the Iban or Sea-Dyaks (Bankfield Museum), the Japanese,⁵ Philippine Islanders,⁶ the Koreans,⁷ the Santa Cruz Islanders (Bankfield Museum), the Caroline Islanders, the Aztecs,⁸ and Modern Mexican tribes (British Museum), and so on—a fairly wide circle of users. On the British Museum Ainu loom the back strap is of bark, on the specimens in the Horniman Museum and the Royal Scottish Museum, Edinburgh, it is of wood.

The Ainu, as observed, use non-spun bast filament in single strips both for warp and for weft. A similar non-spun filament, but in much broader strips, and on a much cruder loom, is used by the Kwakiutl Indians for mat-making.⁹ The Santa Cruz Islanders use a non-spun filament for their warp, and a twisted filament or thread for the weft; what the latter is made of I have not been able to ascertain, but the warp is said to be obtained from the stem of a black banana!¹⁰ According to Lieut. Emmons, in the manufacture of the Chilkat blanket the inner bark of the yellow cedar (*Chamaecyparis nootkatensis*) and of the red cedar (*Thuja plicata*) is laid up in a two-stranded cord, so it is bast thread and not non-spun bast filament.¹¹ Otherwise the great field for non-spun filament used for weaving and drawn from the *Raphia* palm is the vast region of that palm's habitat in Africa. But beyond using a non-spun filament, there is nothing in common between the looms of Africa and the looms of the Ainu. In a Shan head-dress in Bankfield Museum some weft is of non-spun filament-like palm leaf splittings, and native cotton warp.

There does not appear to be any warp beam in the Ainu loom, a *warp pey* (Fig. 27) being used instead, and is driven into the ground, as is evident from the specimens in the British Museum, Royal Scottish Museum, Edinburgh, and Horniman Museum. Hitchcock does not mention any warp attachment, and Bird mentions the use of a hook.

¹ *Unbeaten Tracks in Japan*, 4th ed., Lond., 1881, ii, 92.

² W. H. S. Landor, *Tibet and Nepal*.

³ Falcot, *Traité*, 1852, Pl. 224.

⁴ Joyce and Thomas, *Women of All Nations*.

⁵ v. Bavier, *Japan's Seidenzucht*, Pl. IV, Fig. 3.

⁶ Worcester, *Philippine Journ. Sci.*, I.

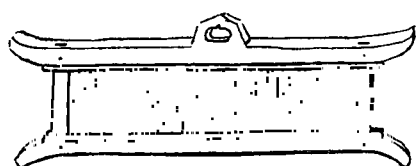
⁷ Cavendish, *Corea and the Sacred White Mountain*.

⁸ Kingsborough's *Mendoza Codex*.

⁹ M. L. Kissel, *Aboriginal American Weaving*.

¹⁰ Florence Coombe, *Islands of Enchantment*, London, 1911, p. 175.

¹¹ "The Chilkat Blanket," *Mem. Amer. Mus. Nat. Hist.*, iii, p. iv, Dec., 1907.



WARPSPACER AINU BRIT. MUS.
FIG. 8

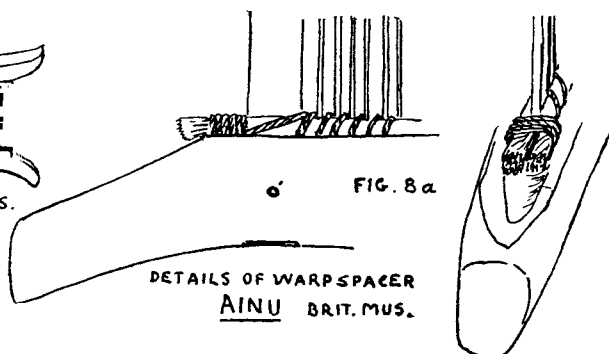


FIG. 8a

DETAILS OF WARPSPACER
AINU BRIT. MUS.

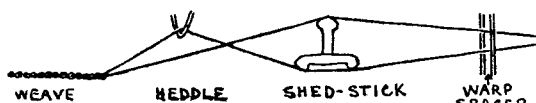


FIG. 9. AINU BRIT. MUS

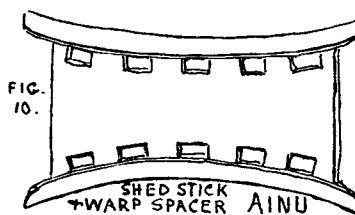


FIG. 10.

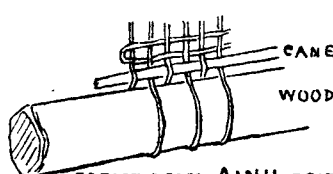


FIG. 11

BREAST BEAM AINU BRIT. MUS

{ IN THE EDINBURGH
SPECIMEN THIS
CANE IS REPLACED
BY STRAW

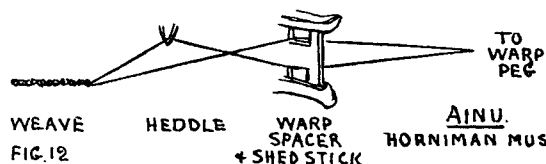


FIG. 12. AINU HORNIMAN MUS



FIG. 13. AINU HORNIMAN MUS.

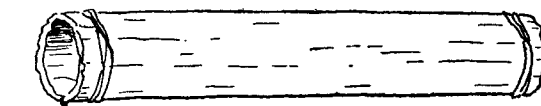


FIG. 14. AINU EDINB + GLASGOW SHED STICK

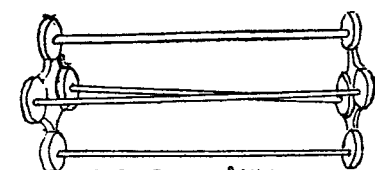


FIG. 15. SHED STICK AINU DATCHELOR 1892

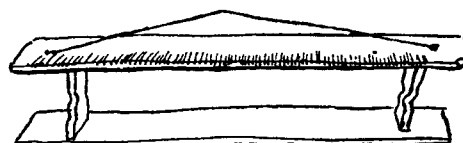


FIG. 16. SHED STICK AINU EDINB. MUS

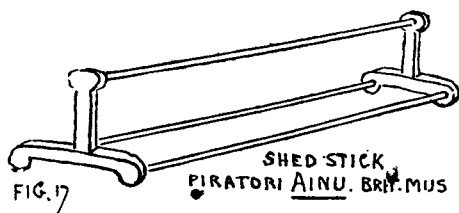
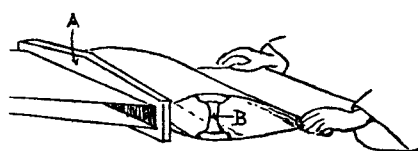


FIG. 17. SHED STICK PIRATORI AINU BRIT. MUS

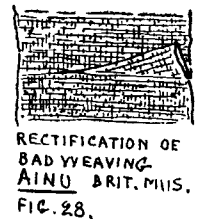
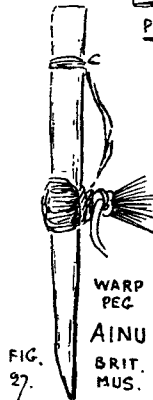
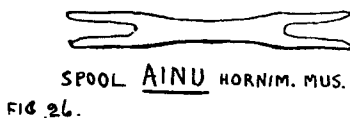
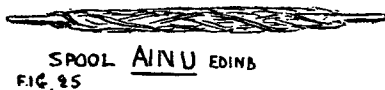
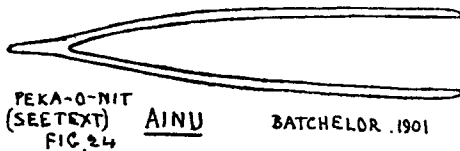
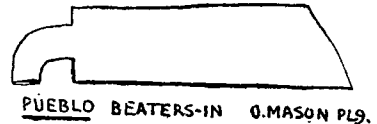
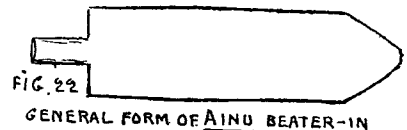
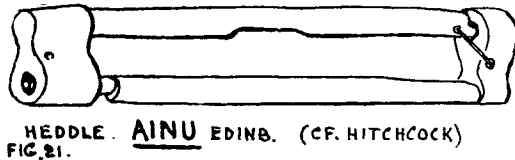
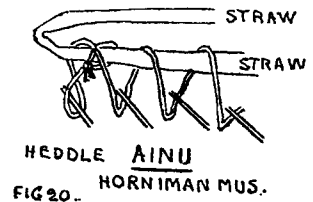
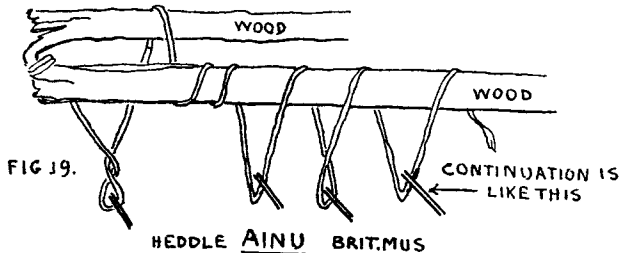


A. WARPSPACER
B. SHED STICK
AINU DATCHELOR. 1892.

FIG. 18

At the breast or *cloth beam* there is a heading rod (Fig. 11), as shown in the illustration; in the Royal Scottish Museum specimen the heading rod is made up of several pieces of straw, and in the British Museum specimen it is a piece of cane.

The warp length in the British Museum specimen is 14 feet (or 4.25 m.) from beam to beam, with a width of fabric of $10\frac{1}{2}$ inches (or 26.5 cm.) and about 16 picks



to the inch (or 7 to the cm.). In the Royal Scottish Museum specimen, the warp is many feet long with a fabric width of $12\frac{1}{4}$ to $12\frac{1}{2}$ inches (or 31 to 31.7 cm.). In the Horniman Museum narrow loom the length of the warp is 8 feet 10 inches (or 2.7 m.) with a fabric width of $1\frac{7}{8}$ to 2 inches (or 5 cm.).

The warp and weft are both continuous. Bird mentions that the knots on the warp and weft are kept well out of sight; this is, however, not always the case.

The only *pattern* I have seen in these cloths is one formed by the introduction

of blue, green and white Japanese cotton warp threads in the centre of the work. Bickmore also mentions this.¹

The Ainu horned *bobbin* (Fig. 26) is called *ahunka-mit* ; as shown in the diagram of the development of the spools it will be seen that these people follow method *A* in its various stages.

The *heddle*, for which I cannot find the native name, is of the single lifter type (Figs. 19 and 20), and like all other parts of the loom, varies considerably. In the British Museum specimen it consists of a piece of stick bent double ; in the Horniman Museum specimen it is a piece of straw bent double ; in the Pitt Rivers Museum, Oxford, it is a plain cylindrical rod. In the Royal Scottish Museum, Edinburgh, one specimen (Fig. 21) is a rectangular frame made up of two shaped pieces, the leashes hanging from the lower rod, while the lower side of the upper rod is cut away for a hand grip. This form is somewhat similar to that illustrated with a woman at work, by Hitchcock (Fig. 3), but which has been distorted out of all semblance by Ephraim (Fig. 4). In the Matsmae panorama (Fig. 7), reproduced by David MacRitchie,² the heddle looks to be a plain rod with its leashes as in the Pitt Rivers Museum, Oxford, while in the Yezo-Manga pictures (*ibid.* Plate XVII) the rod has a bow handle (Fig. 6).

The heddle leashes are of coloured Japanese thread.

The *shed-stick*, *kamakap*, is peculiar throughout, and in some forms quite different from that used by any other peoples in so far as my enquiries go. One form (Fig. 13) consists of three cylindrical rods, which fit at their ends into circular plates as in the Horniman Museum specimen ; others, in the British Museum (Fig. 17) and Pitt Rivers Museum, Oxford, have the end plate made like an inverted **L** ; while Hitchcock's illustration (Fig. 3) shows the end plate as an inverted **A**. The Yezo-Manga (MacRitchie, Plate XVII) drawing (Fig. 6) shows three rod ends without any plate, which is evidently an oversight. Sometimes there are four rods as shown by Batchelor (Fig. 15), which fit into a fancy end plate, or they are fitted into a square plate as indicated in the Matsmae panorama (MacRitchie, Plate IX) (Fig. 7). In the Royal Scottish Museum, and in the Glasgow City Art Gallery and Museum, there are specimens of the shed-stick, made out of lengths of the stem of the rice paper plant, *Fatsia papyrifera* (Fig. 14), as kindly identified for me at the Royal Botanic Gardens, Kew—evidently similar to the one mentioned by Bird. To preserve the ends from splitting, they are bound with bast filament. Still a different form is exhibited in the Royal Scottish Museum, Edinburgh (Fig. 16). It looks like a miniature bench, and is much scored by the friction of the warp threads in making the sheds. It is shown end on in one of Batchelor's illustrations (Fig. 18), reproduced herewith. There is also a shed-stick and warp-spacer combined, and this I will refer to presently.

The Ainu evidently make mistakes like other people. In the British Museum

¹ *Trans. Amer. Journ. Science*, 1856.

² *The Ainos*, Suppl. to vol. iv, *Archiv Intern. d'Ethnographie*, 1892, Pl. IX.

specimen (Fig. 28), at a distance of about $1\frac{1}{2}$ in. (or 4 cm.) from the breast beam, the weaver had got much of the weft not at right angles to the warp, owing to the faulty position of the breast beam. In order to remedy this, she has made a triangular pleat of the faulty portion, stitched it back on to the fabric, and so, getting the last few picks correctly at right angles to the warp, proceeded with her work.

We now come to another peculiar feature of the Ainu loom, viz., the *warp-spacer* or *osa*. The *osa* appears to exist in one of two forms, in all specimens and illustrations of Ainu looms, and in one form (Fig. 8) it resembles the well-known *reed*, which is a beater-in and warp-spacer combined. But the Ainu use this tool as a warp-spacer only, and therefore invariably place it between the warp-peg (beam) and heddle, instead of between the heddle and the fabric. When in use, two filaments (sisters) are passed through each dent. This reed-like *osa*, from its make and from its position, indicates want of appreciation of its double function. The other form of *osa* (Fig. 10) used, in the Horniman Museum specimen of an Ainu loom for making a narrow fabric, is simpler in every way. It consists of a single flat piece of wood cut to shape, and is provided with one row of upper holes and one row of lower holes through which bundles of warp filaments are passed and by means of which the *osa* acts as a primitive warp-spacer. This perforated board-*osa* is incomparably simpler than the reed-like *osa*, and therefore most probably preceded the latter. In adopting the reed-like *osa*, which they probably did from outside, the Ainu seemed to have grasped the idea that it was better than their pattern, but evidently either did not grasp its use as a beater-in, or else found that there was not much benefit to be gained by adopting it with the filament they used.

It is to be observed that the Ainu do *not* make use of *laze-rods*, and are apparently among the few primitive weavers who dispense with this tool, the place of which seems to be taken by the *osa*. As already mentioned, the Ainu use a *shed-stick and warp-spacer combined*, and this is the board-like *osa* (Fig. 12) in the Horniman Museum specimen. It is a combination I have not observed in any other primitive loom.

The *beater-in*, or *sword*, *attush bera* (Fig. 22) has the shape of a very broad-bladed knife; in fact, its breadth is its distinguishing feature. I know of no other such broad beater-in on the Asiatic side of the Pacific. Otis Mason calls attention to this beater-in, whose broad batten with a handle is similar to some of those found in the Pueblo region.¹ He gives some illustrations, two of which (Fig. 23), most like the Ainu beaters-in, I reproduce. He does not say whether both edges are equally adapted for the work, as is the case with the Ainu tool. Altogether the Pueblo tools appear to be thick along one edge, and hence similar to one from ancient Peru in Bankfield Museum, and consequently not so similar to the Ainu tool as might be thought at first sight. On the other hand, the existence of the haft may be a connecting link. Batchelor illustrates a tool (Fig. 24), and says it is called *peka-o-*

¹ "A Primitive Frame for Weaving Narrow Fabrics," *Rep. U.S. Nat. Mus.*, 1899, p. 510.

nit, and is used for the purpose of changing the warp threads. Does he mean that it is a primitive heddle? ¹

The forms of the constituents of the Ainu loom are thus seen to be in part apparently local and in part similar to those in use elsewhere. The following summary shows this more clearly, but in studying them it must be borne in mind that this investigation makes no claim to be exhaustive and that negative evidence taken by itself is always liable to be upset.

<i>Ainu Constituents.</i>			<i>Presence or Absence elsewhere.</i>
Warp filament non-spun	...	Present in North America, Oceania, Central Africa.	
Weft filament non-spun	...	Present in N. America, Cent. Africa, Indo-China.	
Back-strap	... ..	Present in Eastern Asia and Archipelago, Oceania, America.	
Spool or bobbin	... ..	Present in various stages of form <i>A</i> in Asia, America, Europe, and Africa.	
Warp-spacer (Fig. 8)	...	Present as reed in Asia, Europe, and parts of Africa.	
Sword or beater-in	... ..	Doubtful similarity in North and South America.	
Heddle-rod	... ..	Same distribution as back-strap, also in Africa in places where cotton weaving has been introduced without the reed.	
Heddle-rod frame (Fig. 21)	...	Absent elsewhere.	
Shed-stick	... ..	Present in some forms elsewhere.	
Shed-stick and warp-spacer	...	Absent elsewhere, except perhaps in America. (Figs. 10 and 12).	
Warp-peg without warp-beam	...	Present in Africa.	
Laze-rods <i>absent</i>	... ..	Absent (?) in America occasionally.	

The question arises, Did the Ainu invent any of the above loom constituents apparently peculiarly their own? To enable us to form any opinion, we must get some notion of their capacity for development or invention, which at a time when they have been driven into cold northerly regions and more or less completely cut off from any outside stimulus except that of their conquerors, is somewhat difficult to do. Judging from the statements made by eye-witnesses and students, the Ainu do not show any capacity for improvement. Von Brandt, German Consul-General for Japan, writing forty years ago on the contact between the Ainu and Japanese, says:—"The Ainos, in spite of this contact, continuing for thousands of years, have adopted nothing from the Japanese; they are what they were—a race standing at the lowest stage of culture, and probably also not capable of

¹ In the first edition of his book the names of two of the constituents have in error been transposed.

civilization. . . ."¹ A very sweeping assertion; nor have we any means of proving that the contact has continued for thousands of years, and it is obvious to any student that the Tasmanians, Australians, Fuegians, and Punans stood or stand on a lower stage than the Ainu.

A more recent investigator, Romyn Hitchcock, already quoted, is almost equally severe, saying:—"The Aino in close touch with Japanese civilization remains, intellectually and otherwise, as much a savage in culture to-day as he ever could have been. . . . They now use Japanese knives instead of stone implements and metal arrows in place of flints. But it is scarcely a century since they emerged, and otherwise they have not passed beyond it. . . . The Aino has not so much as learned to make a reputable bow and arrow, although in the past he has had to meet the Japanese, who are famous archers, in many battles" (p. 433). As to the bow and arrow, we meet with a flat contradiction from the pen of B. Douglas Howard, according to whom the Ainu are good shots and make a good bow, which at about forty to sixty feet range could be almost as effective as a rifle.² This was in Sakhalien, where the Ainu are free from Japanese oppression. It is going a long way beyond our experience of the evolution of culture to expect that a Stone Age people coming into hostile contact with the much higher metal-using civilization of a more fecund race should adopt some of the latter's culture, especially when, as in the case before us, the Japanese have until recent years been quite oblivious to the interesting character of the Ainu, and have treated them accordingly—in other words, oppressed them rigorously.³ The Ainu are flesh-eaters, but the Japanese do not allow them to kill the native deer, and have taken their fish stations away from them, forcing them to become vegetarians.⁴ Such treatment must tend to degeneration, yet, in spite of it, the Ainu have adopted some tools and methods from their oppressors.

Batchelor informs us the Ainu now use Japanese matches instead of obtaining fire by friction with elm roots, and later with flint, and flint and steel, also that they use Japanese razors instead of sharp flints and shells for shaving purposes (*op. cit.*, pp. 47, 139, 149), while Hitchcock has shown that they have discarded flint arrow heads for Japanese steel ones. The Ainu have also introduced Japanese warp threads into their looms. These adoptions apparently needed little mental effort, but, judged by their stage of culture, greater than we can perhaps conceive. It is progress in a slow way. They have gone a big step further, for, as A. S. Bickmore recorded some fifty years ago, they had begun to *work* iron, a very remarkable action for a Stone Age people.⁵ The advance so made is still due to contact, but it argues ability for improvement in that they understand there are

¹ *Journ. Anthropol. Inst.*, iii, 1874, p. 132.

² *Life with Trans-Siberian Savages*, London, 1893, p. 80.

³ It will be understood, of course, that I am speaking of the *past*.

⁴ Batchelor, 1901 ed., pp. 17-18.

⁵ "Some Notes on the Ainu," *Trans. Ethn. Soc.*, vii, N.S., 1869, p. 17.

ways superior to their own, and are prepared to make an effort to attain the new object.

Further light may possibly be gathered from an examination of their cranial capacity. From the measurements of seven Ainu skulls in the Museum of the Royal College of Surgeons, London, kindly supplied to me by Professor A. Keith, F.R.S., it appears that the average content is 1509 c.c., with a variation from 1400 to 1630 c.c., results which Professor Keith informs me are somewhat on a par with those of the average European. Most students who have gone into the question of the relation of the size of the brain to its intelligence would probably agree that in bulk the size of the brain is an index to at least potential mental ability. From this we may conclude that the Ainu may be quite capable of improvement.

The persistence in the use of the non-spun bast filament and the presence of varied forms of shed-stick and the absence of laze-rods point to isolation, and the varied forms of the shed-stick also point to progress.

If to the above points tending to show that there is a potentiality for progress and to the actual record of progress we add the otherwise doubtful negative evidence that certain constituents of the Ainu loom are not found elsewhere, we may, I think, acknowledge that these constituents are indigenous to the Ainu, and not due to contact.

4.—SOME AMERICAN LOOMS.

1. In the Royal Scottish Museum, Edinburgh, there is a specimen of a loom obtained from the North American Slave Indians with a porcupine quill fillet in the process of making. In a previous paper¹ I described some of the methods employed by the North American Indians in the production of their quill-work decoration, but the method of manufacture of this fillet is quite different. It does not appear to have been described so far, and seems to me to be worth calling attention to (Figs. 29 and 30).

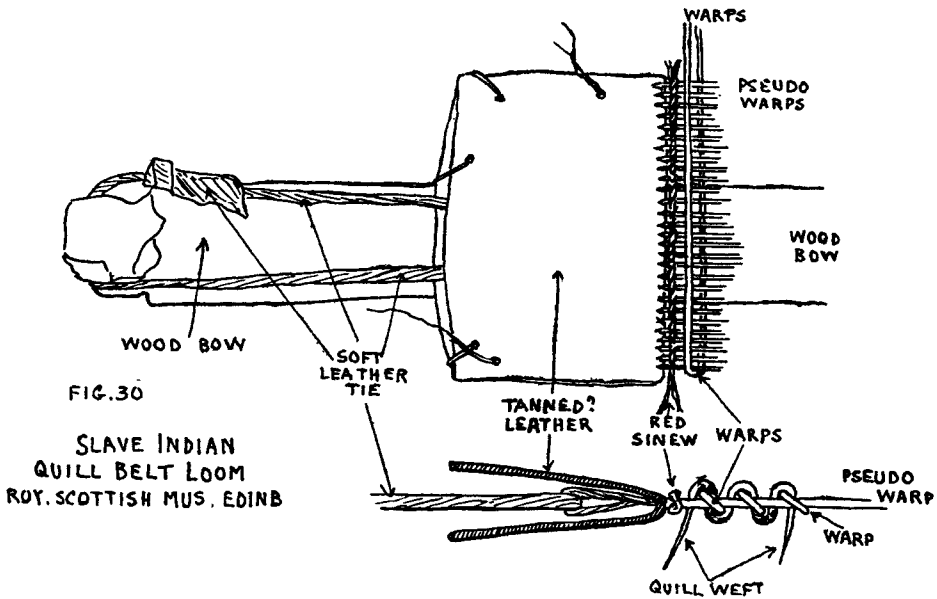
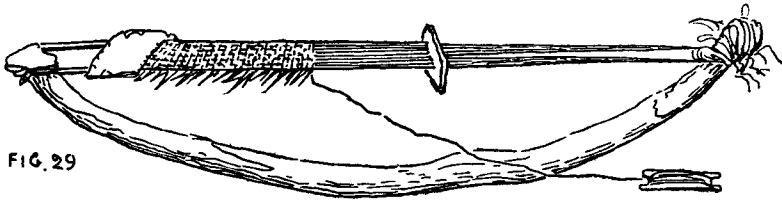
The frame is merely a piece of a branch about 1 inch (or 2·5 cm.) in diameter, bent artificially into the shape of a bow, the chord being $23\frac{1}{2}$ inches (or 60 cm.) long from tip to tip, with a depth of about $2\frac{3}{4}$ inches (or 7 cm.). There is a piece of folded, tanned (?) leather fixed at about 3 inches (or 7·5 cm.) distance from one end of the bow, being held in position on the one side by a tie of soft leather (buck-skin), and on the other side by a set of twenty-eight pseudo-warp threads. The leather as folded measures $1\frac{7}{8} \times 1\frac{1}{4}$ inches (or $4\cdot8 \times 3\cdot2$ cm.). As will be seen directly, these apparently warp threads are only warp-thread supporters. All the threads consist of two lengths of non-coloured sinew twined together. One end of every thread is made fast at the warp end of the bow, passes through the pseudo-warp-spacer into the inside of the folded leather by means of a slit at the folding, passes

¹ "Moccasins and Their Quill Work," *Journ. Roy. Anthropol. Inst.*, xxxviii, 1908, pp. 47–57.

through the loop of the buckskin tie, and returns through the adjoining slit to the bow end it started from.

The pseudo-warps are kept in workable position by a pseudo-warp-spacer, which consists of a piece of birch bark 2 inches wide by $1\frac{1}{4}$ inches wide (5.1×3.2 cm.), perforated with twenty-eight holes in the same horizontal line, the pseudo-warps passing through these holes. When all the pseudo-warps are in position the folded piece of leather is sewn up with a few sinew stitches.

The first transverse, which is only apparently the weft, consists of two pieces of red-stained sinew which are twined alternately under and over the pseudo-warps. Then the sinew from the spool, which is continuous and not stained in any



way, is wound round the whole lot, forming a set of real warp threads at right angles to the pseudo-warps, both above and below them.

Variously coloured porcupine quills, which form the weft, are then inserted from below between the pseudo-warps, and bent into position over and under the warp, and so the fabric is made. By well pressing back the warp after the quill insertion, the upper and lower warp are brought into the same vertical plane and remain unseen. It is a very ingenious piece of work.

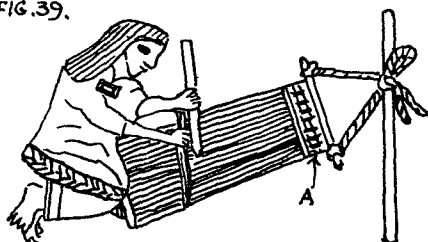
2. In the Cambridge Museum of Archæology and Ethnology there is a Kachiquel Indian loom brought over in 1885 by A. P. Maudsley. The interesting part about

it is that, after a start has been made at weaving at one of the beams for a length of 5 inches (or 13 cm.), a second start has been made at the other beam, which extends to a length of $20\frac{1}{2}$ inches (or 52 cm.); then there are the bare warps between the two webs for a distance of $54\frac{1}{2}$ inches (or 1·37 m.). From the second start the weaving would be continued until the two webs meet, where, owing to the difficulty of making a shed in the ever-narrowing space between the webs, the full quantity of picks could not be made, and hence there remains a coarseness or openness which is easily noticed. A piece of cloth so woven by the Hopi has been given to Bankfield Museum by Miss B. Freire-Marreco.

This method of a double start, which may be a substitute for laze-rods, appears to be an American characteristic, and is not modern, for it shows itself in the upper portion of the illustration (Fig. 39) of a loom in the Mendoza Codex as reproduced by Kingsborough. The dimensions of this Kachiquel loom are as follows: length from beam to beam inclusive, $78\frac{3}{4}$ inches (or 2 m.); the beams are of hard wood, 2·4 cm. (or about 1 inch) in diameter; there are 84 warp threads to the inch (or 33 to the cm.); the warp is woven double (*i.e.*, "sisters," two threads as one, but *not* of "doubled"¹ yarn); there are 30 picks to the inch (or 11·8 to the cm.); the weft is single except for about 14 picks at the heading and tailing. The temple (Fig. 36), or instrument for keeping the width of the web correct and the selvages parallel, is made of a portion of a reed with a piece of needle stuck in at each end for fixing to the cloth. The temple is placed *underneath* the finished cloth. The spool is the primitive longitudinal type *A* of my diagram. The beater-in has a hard convex surface, tapers at both ends with irregular edges. The shed-stick is of cane, with Balfourian ornamentation at the node, gummed up at the end, and apparently filled with seed (?), which rattles when shaken. The "Oxford check" pattern on the cloth is obtained by means of red warp threads at intervals of 3·5 cm., crossed by red picks at intervals of 4 cm., for which a special red-yarn spool is provided.

3. A loom from Uitoto, in the Peruvian part of the head of the Amazon district, and now in the British Museum, has two peculiarities worth mentioning. The heddle leashes, which are of the spiral form, instead of hanging direct from the heddle rod, hang from an attached cord (Fig. 34), and the temple (Fig. 37) consists of a piece of hollow cane with a loose very thin piece of cane running through it, the protruding ends of which are stuck into the finished portion of the web, practically similar to that of the above-mentioned Kachiquel loom. The dimensions are :

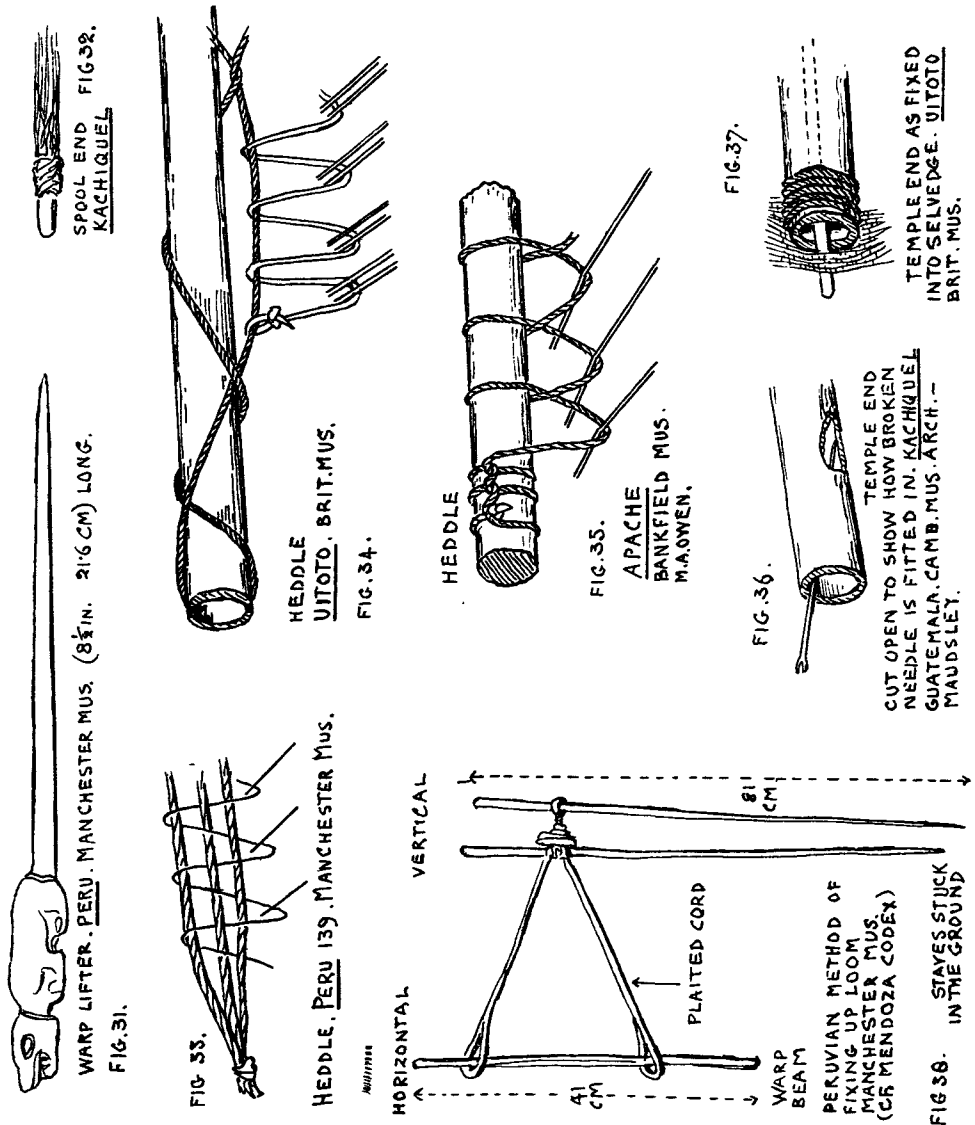
FIG. 39.



NAHUA (ANCIENT MEXICAN) GIRL WEAVING. MENDOZA CODEX, KINGSBOROUGH VOL. I. PL. 61. — NOTE THE BIT OF WEAVING AT THE WARP END A.

¹ "Doubled" is a term used to denote two or more threads twisted into one, and known as two-ply, three-ply, six-ply, etc.

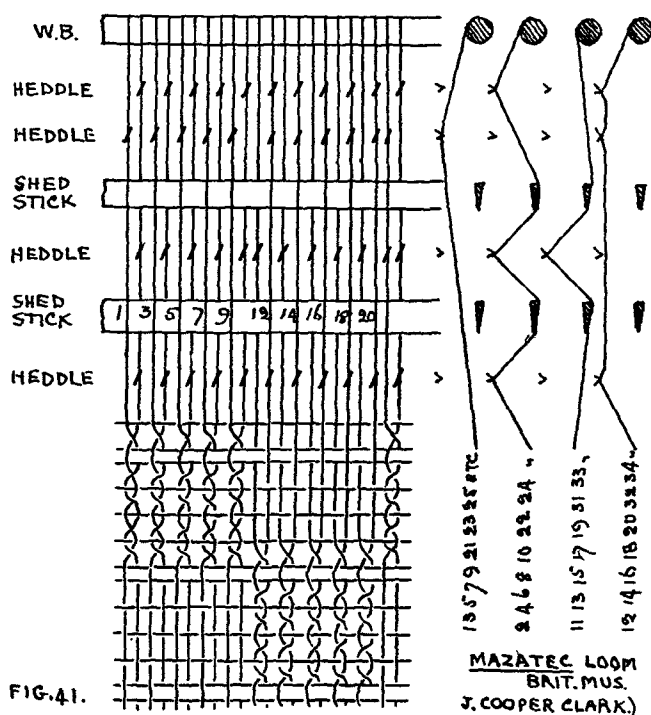
length, beam to beam inclusive, about 14 feet (or 4.25 m.); width of web, $17\frac{1}{2}$ inches (or 44.5 cm.); 64 warps to the inch (or 25.6 to the cm.); the warps are sisters, same as the Kachiquel warp; 25 picks to the inch (or 10 to the cm.); the wefts are single. Both warp and weft are continuous. The spool is of the primitive longitudinal type (*Aa*). The shed-stick is a palm midrib or stem.



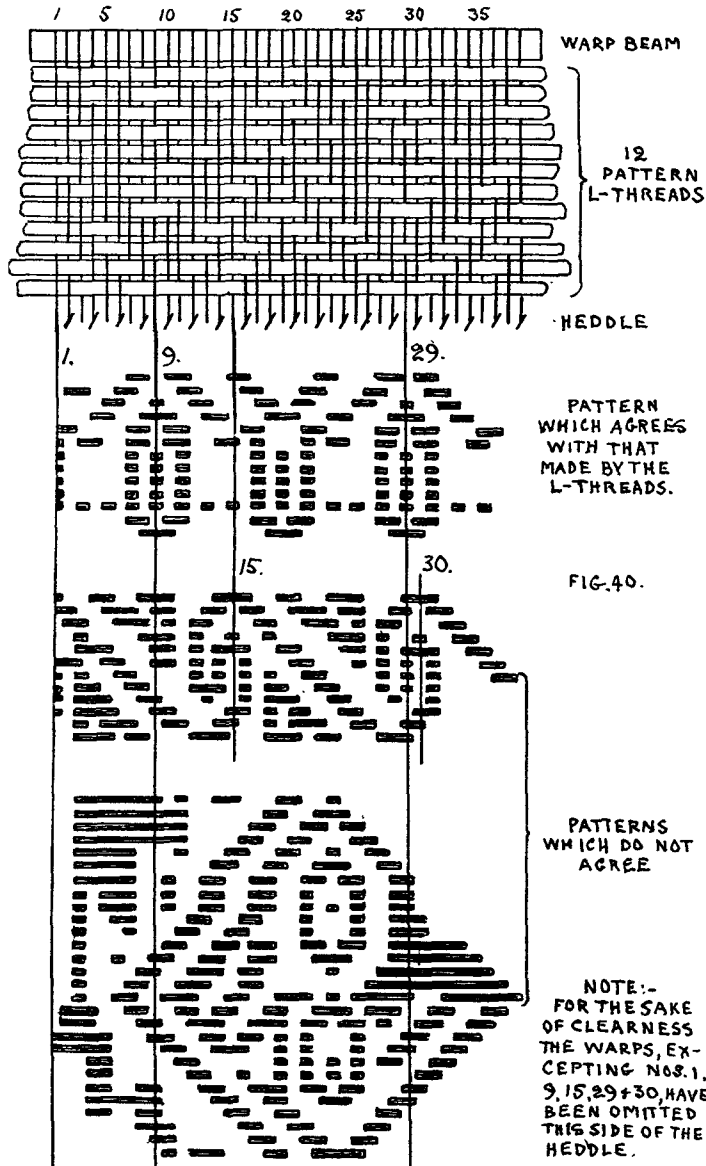
4. A very interesting loom (Plate XII) is that brought from Mazatec, Arizona, by J. Cooper Clark, and now in the British Museum; for besides the plain up-and-down web, a large portion is devoted to twist or gauze¹ weaving, while a considerable piece of the plain web is afterwards covered by a woven-in design of dark blue

¹ Gauze, formed by crossing adjacent warp threads and bound by weft at the point of junction.

wool. Beginning at the breast beam, there are 10 plain picks, then 1 of gauze, then 4 more plain picks, whence the gauze weaving extends a length of about $8\frac{1}{2}$ inches (or 22 cm.), and on this is woven the pattern just mentioned; then we have a further 6.5 cm. (or $2\frac{5}{8}$ inches) of gauze; then 1.4 cm. (or $\frac{9}{16}$ inch) of plain weaving, followed by 7.6 cm. (or 3 inches) of gauze, and so on. The warp lay-out for accomplishing the gauze is shown in Fig. 41. It should be noted that on this loom, as on the Kachiquel loom, a piece of the tailing has been completed before the heading was started on. The dimensions are: length, beam to beam inclusive,



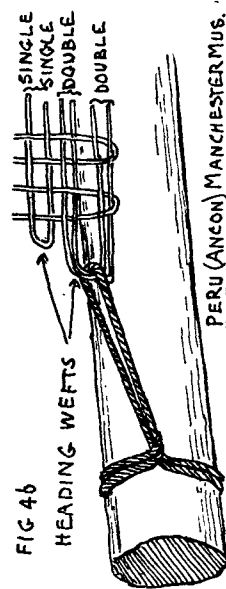
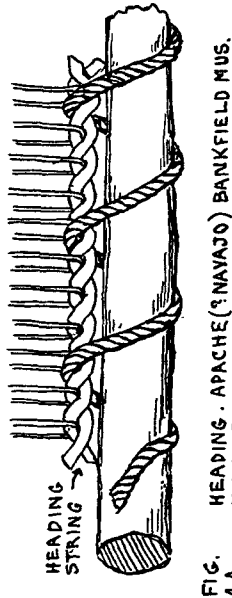
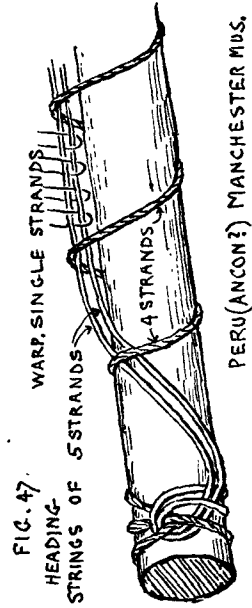
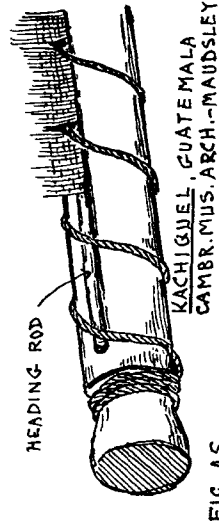
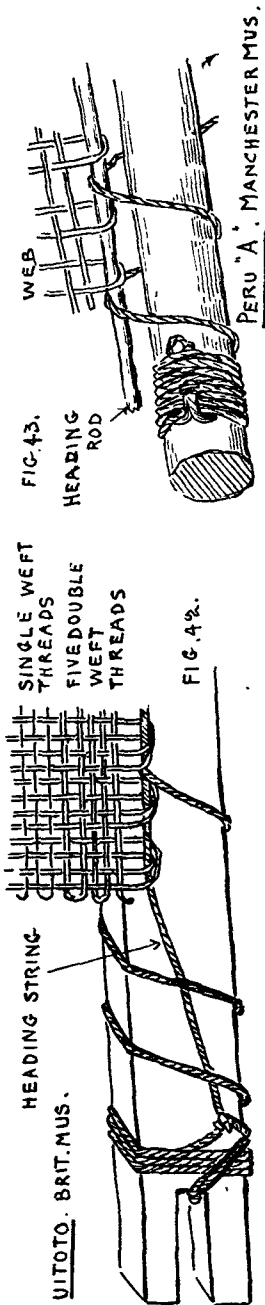
to a lesser extent in, so far as I know, the Eastern Archipelago. This method consists in preparing the pattern in the warp so that the weaver not only has the pattern in front of him, but is also, by the arrangement of the warps, guided as to where the pattern is to be placed, and so ensuring regularity.



ANCIENT PERU. No 139. MANCHESTER MUSEUM

As will be seen from the diagram (Fig. 40), there are twelve pattern laze threads interlaced in the warp; by this regulated interlacing the pattern can be distinguished, and it is clearly reproduced in the web, in so far as that has been completed. It is probable that, as the weaving progressed, the pattern laze threads nearest the web, and therefore done with, would be removed, and if necessary

re-inserted above the others in such new arrangement as might have been necessary. It will be noticed that the pattern commences to repeat itself at every twentieth warp. Not so, however, as regards the second pattern in the web, which repeats



itself at every fifteenth warp; hence the arrangement shown in the warp does not apply to the second one, and hence also it is obvious that for every different pattern there must be a different arrangement of the laze threads interlacing the warp.

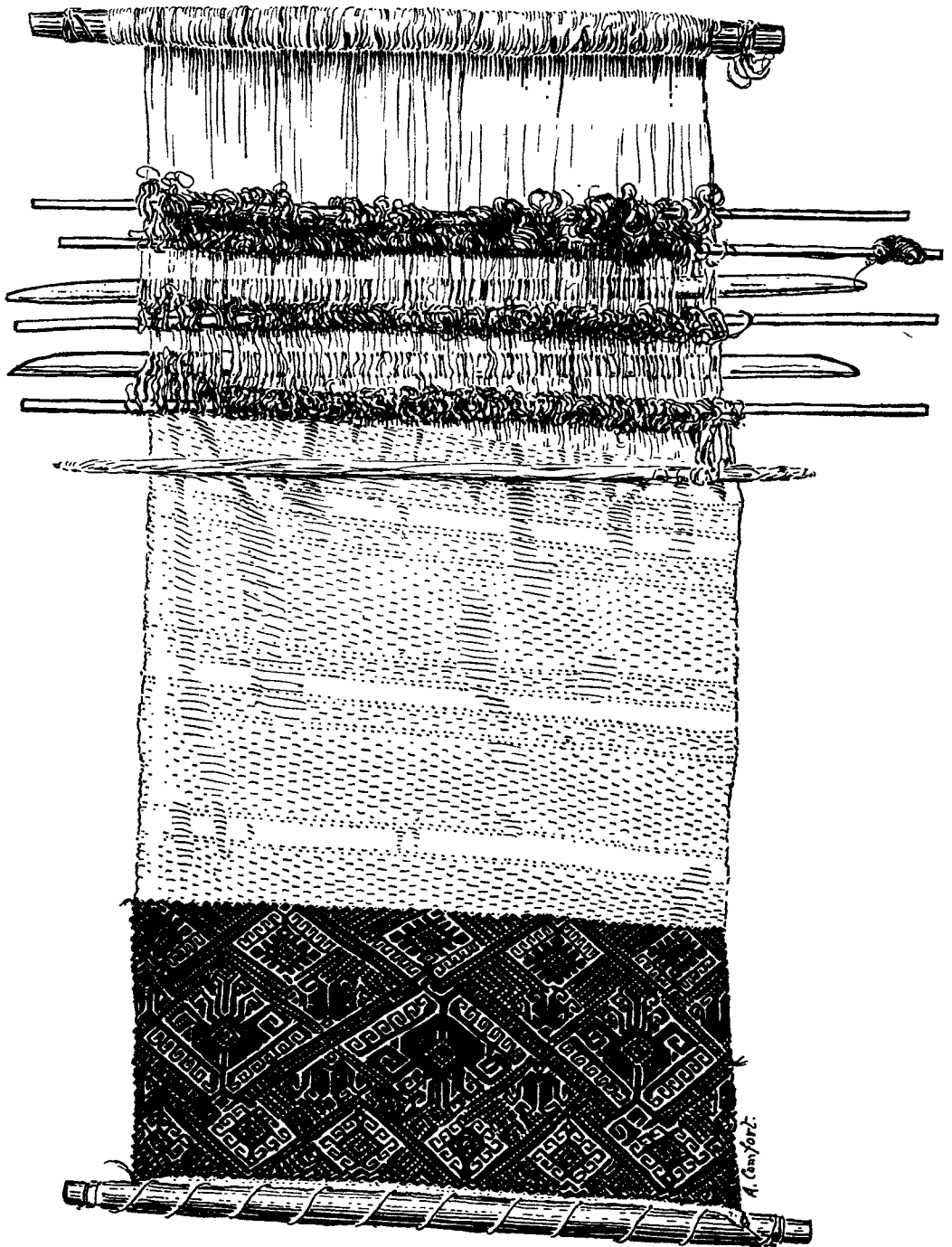
There is a third pattern which does not agree with either the first or the second, and there is also a fourth (in tapestry work, but not shown on the diagram), which likewise does not agree with the others. Crawford speaks of short pieces of cane found amongst the *débris* of Peruvian tombs and also on unfinished Peruvian looms which apparently serve the same purpose as these pattern laze threads. The heddle consists of three pieces of cord (Fig. 33) without any rod, nor is there anything to indicate that there ever was a rod.

The dimensions of this loom are: length, beam to beam inclusive, $22\frac{1}{2}$ inches (or 57 cm.); width of web, $16\frac{1}{2}$ inches (or 42 cm.); about 19 warps to the inch (or 7.5 to the cm.); 144 picks to the inch (or 57 to the cm.) in the plain web and 93 to the inch (or 37 to the cm.) in the pattern.

Among some loose weaving and spinning tools from ancient Peru in the Manchester Museum are some staves (Fig. 38), evidently for holding the loom in position while weaving is in progress, the warp end being fixed on to the staff and the breast beam being held by means of a waistband round the body of the kneeling Nahua weaver, as shown in the Mendoza Codex (Fig. 39). On one loom, marked "Apache" (? Navajo) in Bankfield Museum the heddle leashes are crossed spiral in form (Fig. 35).

There is in all these looms a very great diversity in the warp attachments to the breast beams or headings, as shown in Figs. 42–47. The warps are attached to a heading string or rod, which in turn is attached to the breast beam by a binding string. In one specimen (Fig. 44) the two heading cords are twisted so as to catch a warp loop at every twist, and so act as a warp spacer or laze rod, while in another (Fig. 40) the web commences without any heading string or rod at all. In none of them is the warp supported directly on the beam. Whether this is so in American looms in general I cannot say.

(Part II, "African Looms," to follow.)



MAZATEC LOOM. BRITISH MUSEUM (J. COOPER CLARK).

EVOLUTION IN MAORI ART.—II. PENDANTS.

By H. D. SKINNER.

[WITH PLATES XIII-XVIII.]

1. THE MAORI *HEI-TIKI*.

MANY writers have put forward theories as to the purpose and meaning of the Maori *hei-tiki*. The great value placed on these neck pendants by native owners, the skill and industry required in their making, and the grotesque appearance of the finished article, unite to make them the most interesting of all Maori ornaments. As regards their artistic merit, one writer, Von den Steinen, considers the *tiki* "perhaps the ugliest object the artistic genius of a people ever created by years of labour."¹

Plate XIII represents an exceptionally fine specimen. Its height is $5\frac{1}{4}$ inches, its maximum width $3\frac{1}{2}$ inches, and its thickness about $\frac{3}{4}$ inch. Its head is inclined towards the right—that is, its right eye is higher than its left. The iris of each eye is represented by a ring of *paua* (haliotis) shell, the serrations in which probably represent eye-lashes. The nostrils are clearly marked, and the bridge of the nose is represented as in orthodox Maori carvings in wood. The huge mouth is shaped like a flattened heart, having teeth indicated medianly above and below, and one at each lateral corner. On the breast lies part of the long forked tongue, the upper end of which has lost all connection with the mouth. The artist in this, as in most cases, was apparently ignorant of the true nature of the forked tongue. Below and parallel with it he has added an inverted V, giving a ribbed appearance to the breast. The arms are akimbo and the legs are curved round in an extraordinary manner. There are, as is usual in Maori carving, three fingers to each hand and three toes to each foot. The navel is shown. The sex is female. The back of the *tiki* is polished and flat, except that the lower edge is bevelled. The head is perforated in the median line, and through the hole there passes a finely plaited flax cord terminating in loop and toggle. The toggle is of albatross wing-bone, and is ornamented at either end with short parallel straight lines, a method of ornamentation common to many districts of New Zealand. At some time the *tiki* has been painted with *kokowai* (red paint).

Plate XIV, which, by the courtesy of the authorities at the British Museum, I am allowed to reproduce from their *Handbook to the Ethnographical Collection*, represents specimens from the collection at the British Museum.

¹ Karl von den Steinen, "Neuzeelandisches Heitiki und Nephritbeil," *Archiv für Anthropologie*, Neue Folge, Band IX, Heft. 1 u. 2.

Plate XV represents a group of fifteen *tikis* from the Otago district, once in the John White Collection. The Otago district is a region of high variability in all forms of Maori art, a variability which is reflected by this collection of *tikis*. I have to thank the Director of the Bristol Museum, where they are now on exhibition, for permission to figure them.

The inner meaning of the *hei-tiki* is not known, and it is doubtful whether it had one. Yate,¹ writing in 1835, makes the following statement regarding *tikis*: "They are by no means connected with any of their superstitions, nor are they, as has been imagined, representations of gods whom they might be supposed to worship. The latter idea was conceived from the *hei-tiki* being taken off the neck, laid down in the presence of a few friends meeting together, and then wept or sung over. But this is only done to bring more vividly to the recollection of those present the person now dead to whom the *hei-tiki* belonged. It is kept and worn about the neck as a remembrance of departed friends, not only of him who last departed, but in remembrance of others also by whom it has been worn."

From this statement and from other considerations, it appears probable that the *tiki* had no religious significance, but that it gathered associations from the people and events with which it was connected. *Hei* is the generic name for neck ornaments. One of the meanings of the word *tiki* is a carved figure. It is also the name of a Polynesian deity, the first man. That the former, and not the latter, is the meaning in the compound word *hei-tiki* is evident from the fact that whenever sex is indicated it is feminine.

Mr. Best has the following passage on the subject:—"In Maori myth it is stated that the first *hei-tiki* was made for Hine-te-iwaiwa by her father. . . . It is known to every old native that this pendant is properly worn by women only, and herein lies the story of its origin. It is highly probable that this curious figure represents the human fœtus, or embryo, as, indeed, some old natives state, and the wearing of it by women is a survival of certain acts connected with phallic symbolism of long past centuries."² There may, as Mr. Best, suggests, be some connection between women and the ornament. It is certainly much more often worn at the present time by women than by men. But in Cook's time it would seem to have been observed on men only, for Banks says, "The men often carry the distorted figure of a man made of green talc."³ It should be remembered that Cook's plates show a proportion of the men wearing the *tiki*, as do other early writers. On the whole it would seem probable that the figure has no special religious significance. Individual specimens would accumulate *mana* from the persons who wore them, the *mana* increasing with age and with the position of the succession of owners. *Tikis* that had in this way accumulated much *mana* would doubtless be produced at times of tribal crises, in case of sickness, or at the birth of a child, just as any other object possessed of *mana* might be produced. The *tiki*

¹ *New Zealand*, 1835, p. 151.

² *Journ. Roy. Anthropol. Inst.*, 1914.

³ *Journal*, p. 225.

was more likely than any other object to accumulate *mana*, and it is probably to this fact and to the skill required in their making that *tikis* as a class owe the veneration in which they were held.

In endeavouring to explain the disproportionate head and the bowed legs of the *tiki*, it has been asserted that the Maori artist intended it to represent the human embryo,¹ and it is on this false assumption that the identification of the *hei-tiki* as a deity connected with birth is usually based. Karl von den Steinen has disproved the assumption, and has reached a conclusion arrived at independently by the present writer. This conclusion is that the disproportionate size of the head, the slant at which it is set, and the curved legs depend not on a realistic representation of the human embryo, but on the proportions of the greenstone adze.

Banks, in his *Journal*,² says, "They hang from their ears by strings very many different things—often a chisel and bodkin made of green talc." The small greenstone adze, probably because it was too heavy for suspension from the ear, was worn about the neck. Plate XVI, 2, shows, on the left, a small greenstone adze intended solely for use, and on the right an adze intended solely for ornament. The blunt edge of the latter and the thinness of the blade are proof of its ornamental nature, quite apart from the hole for suspension and the cord and toggle.

How the proportions of such an adze as this were imposed upon the human figure and produced the orthodox shape represented by Plate XIII will best be understood by a consideration of the early history of the human figure ornament in New Zealand, so far as it can be pieced together.

On the walls of various rock-shelters in Canterbury and Otago are found numbers of paintings. Some are fragments of decorative patterns, some are realistic drawings of fish or of sea mammals, while there are a number of conventional representations of men. The rock drawings have not yet been systematically examined, though they will probably throw much light on the origins of Maori decorative art. Such traditional evidence as we have points to the great antiquity of most of them. The rock drawings as a whole show a remarkable resemblance to the examples of pictorial art reproduced in the Reports of the Cambridge University Anthropological Expedition to the Torres Straits region. There are, however, some points of resemblance to the human figure, as portrayed in the Hervey Islands and elsewhere in Polynesia, so that the determination of outside relationships must await the production of further evidence.

The drawings shown in Fig. 1 are from Hamilton,³ and are typical examples of the human figure from rock shelters in the Waitaki valley. In one the head is erect, while in the other it is entirely wanting. Compare with these the pendant shown in Fig. 2, a specimen of the greatest interest, in the Hocken Collection,

¹ J. MacMillan Brown, *Maori and Polynesian*, p. 196; Best, *vide supra*.

² p. 225.

³ *Trans. N.Z. Inst.*, Vol. 29, Plate 6, and Vol. 30, Plate 7.

Otago University Museum. The design very closely resembles the headless human figure in Fig. 1. The execution is good, the dense black stone of which it



FIG. 1.—ROCK DRAWINGS.

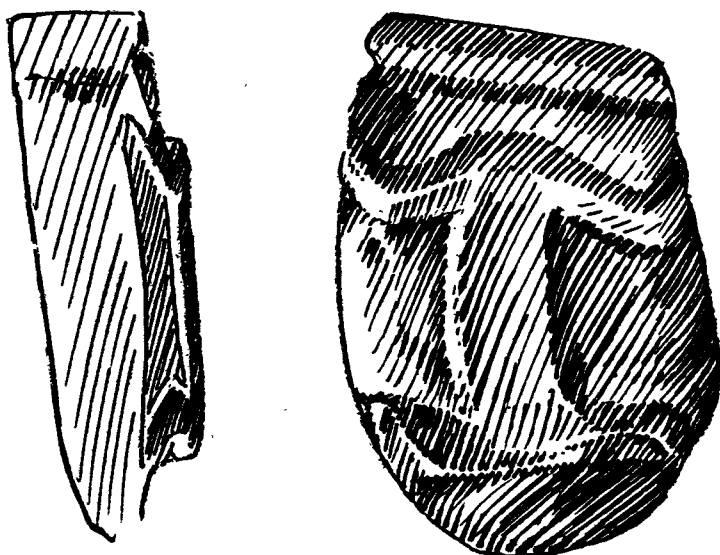


FIG. 2.—PENDANT.



FIG. 3.—ANTHROPOMORPHIC PENDANTS.

is made taking a high polish. One arm is ornamented with notches, which are not shown in the drawing. The non-perforation of the pendant should be noted.

Its length is about $2\frac{1}{2}$ inches. It was found in the Waitati valley.¹ In the Dominion Museum there is a specimen in slate of the same type, but degenerate, from the Southland district. Fig. 3 represents three still more degenerate examples, from the John White Collection in the Bristol Museum. Like the previous figures, they come from the Otago district. The special interest of the type lies in the light it throws on the ancestry of the *hei-tiki*.

The line of subsequent development is clearly indicated by Plate XVI, 1, an interesting and beautiful specimen in the Fels Collection. The head is erect, as in one of the drawings of Fig. 1. The body and legs follow the treatment of Fig. 2, but the notched ornamentation on the arm of that pendant is here transferred to the edges. The perforation and the position of the arms are new. An extraordinary feature of this specimen, which, however, has no bearing on the development we are following, is the tatuing on shoulders and thighs.

Of similar type is the small *tiki* on the left side, middle row, of Plate XIV. In this example the notched ornamentation has been lost, and there is no tatuing. The legs follow the primitive treatment of Fig. 1.

It would seem to be at this point that the adze pendant, an example of which has been already figured, and the human-figure pendant became associated, a union which produced the orthodox type of *hei-tiki* represented in Plate XIII.

Such a pendant as Plate XVI, 2 (specimen to right), must have suggested itself at once to the *tiki*-maker as an admirable beginning for a *hei-tiki*. The polished back-surface was already finished, and the human figure could, without great trouble, be adapted to suit the outline of the adze. To preserve this outline it was necessary to bow the legs in along the cutting edge and to enlarge the head and place it aslant. Such an adaptation would probably be made without trouble, for Maori art was far more elastic and adaptable than many writers have supposed. Plate XVI, 3, is from Von den Steinen's paper, and shows clearly the relation that exists between the two forms. The figure marked "a" is from *Maori Art*² and shows how the adze shape imposed bowed legs on the *hei-tiki*. The figure marked "b" indicates clearly how the square poll of the adze necessitated the slanting position of the head. A most interesting example also illustrating this point is represented by Plate XVI, 6. This specimen has unfortunately lost its cutting-edge. It was originally a fine example of *toki-pou-tangata* or fighting adze, and the upper part is still ornamented with the characteristic notches called *whakataratara*. Its owner evidently decided to make from his *toki-pou-tangata* a *hei-tiki*, and an ordinary *toki* or adze. The unfinished result is highly interesting. Nos. 4 and 5, Plate XVI, show front and back views of another interesting specimen. In this case the *reke* or poll is curved and the eye has been brought further upwards to suit the outline. More labour has been expended on the sculpture of the back than is usually the case, though there are occasional

¹ Locality on authority of J. Edge Partington, *Ethn. Album of Pacific*.

² Plate 49, Fig. 3.

specimens in which the front carving is repeated on the back. Plate XVII, 1, represents another example in which the cutting-edge of the parent adze still exists. This example is from the Fels Collection, and, like Plate XVII, 2, is from the Otago district.

A further orthodox feature inherited from the ancestral adze is exemplified in Plate XVII, 3. It is the flatness of the lateral outlines. This flatness is present in a large proportion of specimens. It is absent in the archaic types, Plate XVI, 1, and Fig. 2, and in the specimen noted on the left of Plate XIV.

Plate XV may be taken as representing an average collection of *tikis*. C3 is more primitive in character than any of the others. It is feminine, and has a rectangular flange for the perforation, a feature common in Otago. The cutting edge of the adze has influenced the legs of all specimens. B4 has been cut from an actual adze. B1 follows the adze shape very closely. Flatness of lateral outline is especially noticeable in A1, A3, A5, B1, B4, C2, C4, and C5.

The specimens figured indicate the close connection between the *hei-toki* (to coin a name) and the *hei-tiki*. Von den Steinen is wrong, however, in stating that every *tiki* was, at one stage in its manufacture, a *toki* or adze. This is true of a limited number of specimens only. Of the remainder about 25 per cent. have the outer curved edge of the legs actually sharp. Of those that are left a proportion, of which that on Plate XIII is one, are bevelled towards this edge at the back. Often the curved edge is broken by two knobs representing the outermost of the three toes on each foot.

Here we may examine parenthetically two other points of much interest in the evolution of the orthodox type. Plate XVII, 5, represents a *hei-tiki*, many of the characteristics of which are archaic. Out of its mouth there projects a reptilian forked tongue.¹ As to the origin and meaning of this forked tongue we have no information whatever. There are specimens in which it passes out of the mouth and lies extended on the breast. By the time this stage was reached, the true significance of the tongue must have been lost to the carver, for it soon loses its connection with the mouth and lies detached like an inverted Y, Plate XV, C2. Plate XIII shows the detached tongue and an additional inverted V representing ribs. This latter appears to have been added by the artist under the impression that the detached tongue was intended to represent the neck and the two topmost ribs. In Plate XVII, 3, the tongue has almost disappeared, and the ribs are clearly marked. In some examples, the tongue has disappeared entirely, the ribs having occupied more than its space. The second point is the concavity of back which may often be seen. It exists in the specimen figured on Plate XIII, but the illustration does not show it clearly. It is a feature transferred to the *hei-tikis* from the carvings of the human figure in wood.

Enough has been already said to indicate the high probability that the

¹ See also Plate XIV, top row middle, and Plate XV, A2, A4.

proportions of the typical *hei-tiki* are determined by those of the greenstone adze. There remain a number of *tikis*, perhaps 10 per cent. of which diverge markedly from that type. These would appear to be either archaic or eccentric. To this latter class belongs the well-known double-headed specimen on the right in the middle, Plate XIV. I cannot agree with Von den Steinen, who says it is pathological,¹ or that its shape depends on defect in material. It is clearly a hybrid resulting from the fusion of two ideas—*matau* and *tiki*. The *matau*, or fish-hook, is often executed in greenstone, and the influence of that motif can be easily detected in this specimen.

Plate XVII, 4, from Von den Steinen, represents a specimen in the Berliner Museum, which he is probably right in regarding as a forgery. Its resemblance to Plate XVI, 6, is accidental. Von den Steinen is in error in stating that the horizontal is the normal position for the *hei-tiki* to hang in. The horizontal position was probably adopted only when the hole for suspension vertically was broken or had not been bored.

Nothing can be said here about bone *hei-tikis*. Genuine ones are very rare, and depart far from the typical form. Forgeries, both good and bad, are common in collections.

From the facts already stated the following conclusions are drawn:—

- (a) The disproportionate size of the head and its slanting position, and the bowed legs of the Maori *hei-tiki*, characteristics which give it a superficial likeness to the human embryo, have not arisen from an attempt of the Maori artist to portray an embryo.
- (b) Two elements have united to form the Maori *hei-tiki*. The first was a conception of the human figure, which included a forked tongue and an arched back. These characteristics it is hoped to examine at some future date. Upon this antecedently existing conception of the human figure there were imposed in New Zealand new proportions and characteristics. These new developments were determined in their nature by the proportions of the second element—the pendant adze.
- (c) The connection between the *hei-tiki* and the rites performed at birth, if such a connection did exist, were not essential, but only secondary, depending on acquired *mana*.

2.—THE PENDANT CALLED "*PEKA-PEKA*."

Plate XVIII, 1, shows a good example of this ornament, which is not uncommon in collections. As in the case of other Maori pendants, little information has been collected from the natives as to its meaning. Some years ago the writer was told by the late Augustus Hamilton that the two outward-facing figures were called the pigeons of Kupe. I do not know on what Maori authority this

¹ *Pathologisches Exemplar.*

statement rests, but the identification of the two monsters as birds is interesting. They are apparently identical with the *manaia* figures so prominent in Maori carving, and there is much evidence to indicate that the *manaia* have a common ancestry with the bird figures from the Melanesian area. This point will be dealt with by Mr. Elsdon Best in his monograph on Maori *pataka* now in the press.

It is interesting to note that an ornament with a similar motif is found in the Melanesian area. Plate XVIII, 2, represents such a pendant from Southern New Guinea or the Solomon Islands. We may regard the bird in the Melanesian design as the frigate bird, which occurs in endless variation in the art of that region.

The *peka-peka* is confined to no one district of New Zealand. Examples in greenstone vary hardly at all in design, but when the more tractable material, bone, was used, the design, as in the case of other ornaments and weapons, became much more variable. Fig. 3 represents a specimen made from human parietal bone. This specimen comes from the north of Auckland. The two *manaia* figures are distinguishable at either end, while between them is a tangle of the curves and scrolls dear to the Maori artist. Fig. 4 represents a specimen in whalebone in the Hocken Collection at Dunedin. Though the locality is not specified it was probably collected from one of the Otago beaches.

Plate XVIII, 5, represents a very beautiful unfinished specimen in the Ethnological Section of the Cambridge University Museum. For the figure I am indebted to Baron von Hügel. The double perforation for suspension may be noted. The inverted V between the figures represents the two arms of the *manaias*.

In conclusion I figure a stone palette of the Egyptian prehistoric period, for which I have to thank Dr. Harrison, of the Horniman Museum. It represents two outward-facing birds. It is interesting to note that in a similar specimen in the Manchester Museum, at Owens College, the iris of the eye is represented by a ring of bone or ivory. In the Maori specimens the iris is represented by a ring of pawa shell.

Plate XVIII, 1 and 3, are from the admirable collection of Mr. Willi Fels. For permission to figure Fig. 2 I have to thank the Director of the Royal Scottish Museum, and for Fig. 4, Dr. Benham.

3.—EVOLUTION OF THE STRAIGHT EAR-DROP.

Perhaps the commonest form of ornament to be seen in collections of Maori artefacts is the long pencil-shaped greenstone ear-drop, of which Fig. 1 is an example. Fig. 2 represents characteristic, but somewhat shorter specimens. In proportions the type shows considerable variation, every length from 6 inches down to 1 being common, the diameter varying as the length. The material almost invariably used was greenstone, though specimens in bone are occasionally seen (Fig. 4). The following facts bear on the probable origin and evolution of this type.

In all collections of any size there are numerous examples of small chisels and gouges. Greenstone specimens are common, and are often beautifully finished. It

should be noted that there are two distinct types of chisel, one being like a small adze and rectangular in cross-section, while the other has a cross-section which is circular. Specimens of both types are often seen with a hole bored near the poll for suspension from the ear or about the neck when not in use. Sometimes an



FIG. 1.
PENDANT.

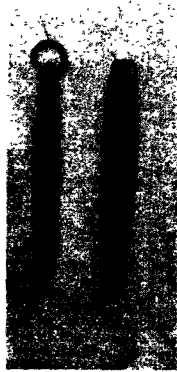


FIG. 2.
TWO PENDANTS.



FIG. 3.
PENDANT CHISEL.

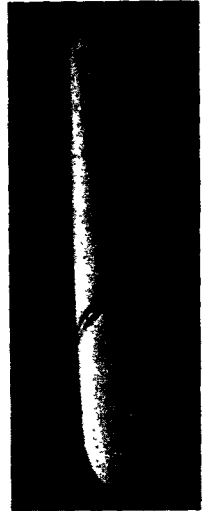


FIG. 4.
PENDANT.



FIG. 5.
PENDANT CHISEL.



FIG. 6.
CHISEL PENDANT.



FIG. 7.
CHISEL PENDANT.



FIG. 8.
PENDANT.

additional flange, intended to carry this hole, is added to specimens of the rectangular type (Fig. 5). This specimen is primarily designed for use, the ornamental function being accidental. It is probable that the symmetrical ornament (Fig. 1) has descended from the greenstone chisel of the circular type, and

that the rectangular type underwent a process of degeneration which tended to converge on the same shape.

Fig. 3 shows an example of the "circular" type, in which useful and ornamental functions appear to be evenly balanced. It is capable of being used in wood carving and also of being worn as an ornament when not in use.

Fig. 6 is an example of the "rectangular" type in which the transition from useful to ornamental is complete. The general outline is retained, but all the edges are rounded, and the cutting edge is too blunt for use. In Fig. 7 the process has gone a step further, this specimen being oval in cross-section. It retains a blunt cutting edge at the lower end, while the upper end is flattened, giving a hint of its rectangular ancestry.

Fig. 8 is a splendid specimen of symmetrical ornament in which the only hint of its ancestry is the blunt and conventional cutting edge at the lower extremity. From this form to the purely ornamental type of Fig. 1 is only the shortest step. When it has been taken the evolution of the symmetrical ornament is complete.

4.—EVOLUTION OF THE CRESCENT PENDANT.

Fig. 1 represents a set of three whalebone pendants, generally called "mat-ornaments," from Taranaki. They were worn suspended at the point where the woven flax mat was fastened on the shoulder. The carving about the middle represents a pair of human faces looking outward. The eyes are not represented, the lower jaw is absent, and the execution does not compare with that of similar carving from the east coast. Apart from the carving, however, the set is a fine one.

This form of pendant appears to have evolved from the bone needle, which, like all other light objects made from attractive material, was worn for ornament when not actually in use. Fig. 4 shows three of these curved bone needles, also from Taranaki. They were used in the process of mat-making, for which in old times the Central Taranaki tribes were famous. Fig. 5 is a curved needle made of greenstone, and from the same district. It is evidently designed equally for use and for ornament. Fig. 3 represents two much larger needles of whalebone. The holes seem to have been burned through with a red-hot nail or a piece of metal. They are intended for use, though for exactly what purpose is not known. Fig. 2 shows a needle pendant intended solely for ornament. The step from the type represented by Fig. 3 to this type is paralleled by the step from the graceful barbed bone point of a pigeon spear to a fat and clumsy pendant copy which was found at Purakanui by Dr. R. Buddle. The addition of the carving gives the mat-ornament of Fig. 1.

An interesting variant form is exemplified by Fig. 6, in the White Collection, found near Dunedin. This fine pendant is about 12 inches in length. Its most interesting feature is the bend, not very clearly shown in the figure, about 2 inches from the upper end. This kink divides the great curve of the needle into two



HEI-TIKI : BACK.

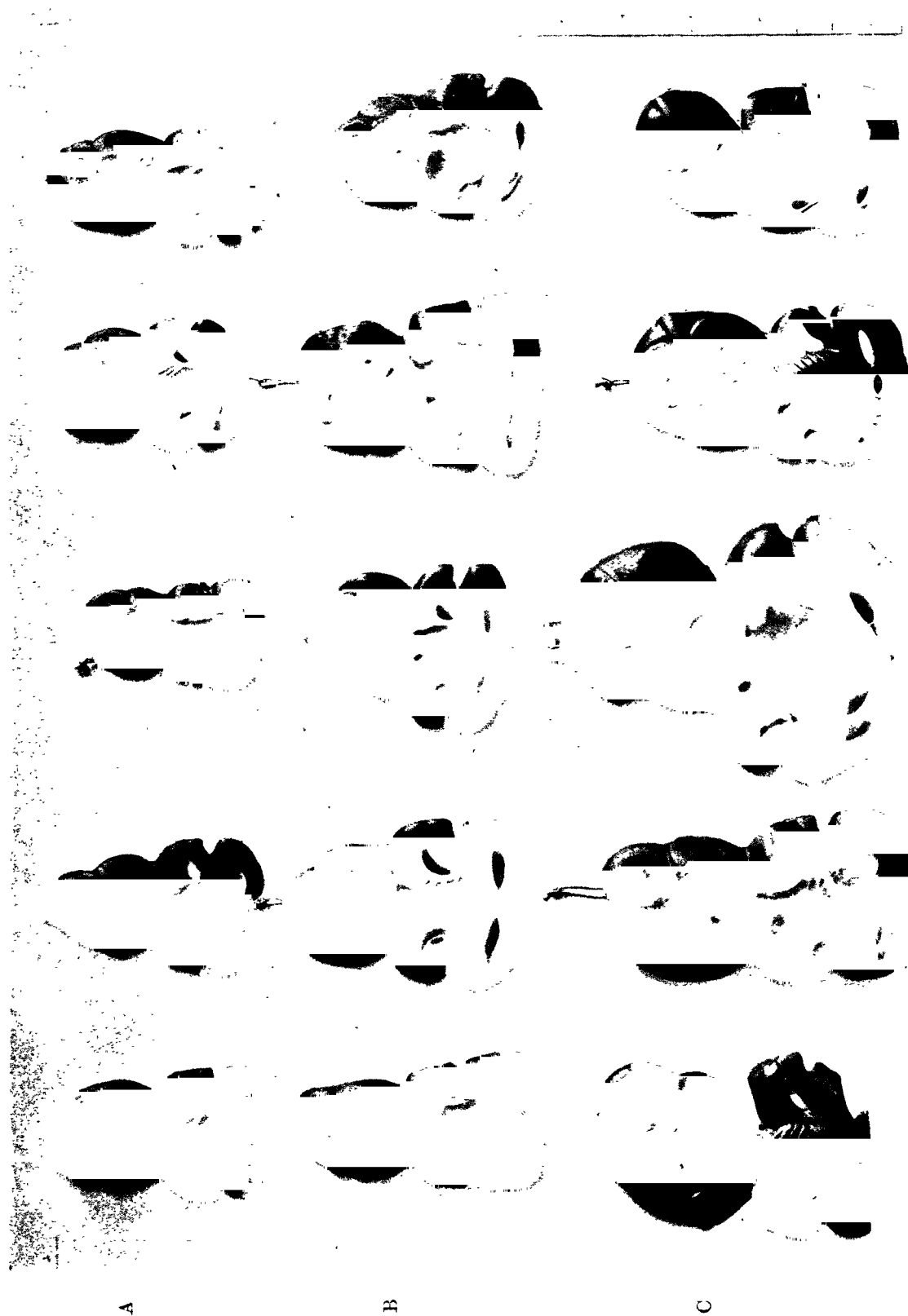
EVOLUTION IN MAORI ART.

HEI-TIKI : FRONT.



EIGHT HEI-TIKI (BRITISH MUSEUM).

EVOLUTION IN MAORI ART.



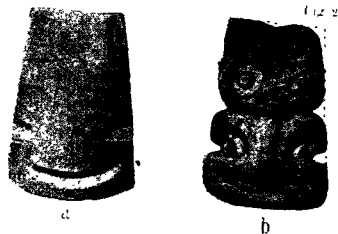
FIFTEEN HEI-TIKI (BRISTOL MUSEUM).
EVOLUTION IN MAORI ART.



1. HEI-TIKI.



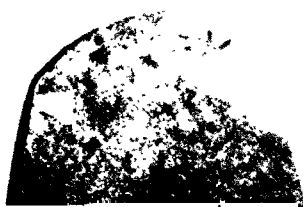
2. ADZES.



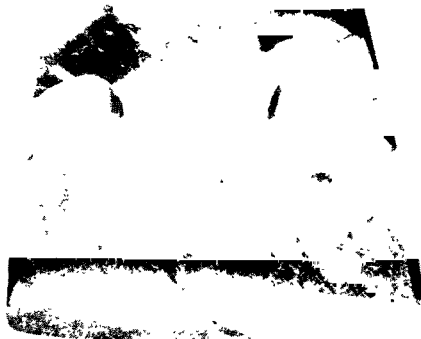
3. ADZE AND HEI-TIKI.



4. TIKI MADE FROM ADZE.



5. BACK VIEW OF NO. 4.



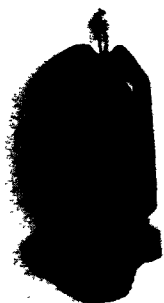
6. TIKI IN PROCESS OF MANUFACTURE.



1. HEI-TIKI MADE FROM ADZE.



4. ADZE.



2. HEI-TIKI MADE FROM ADZE.



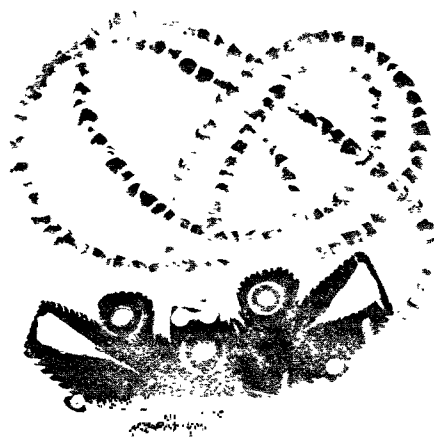
3



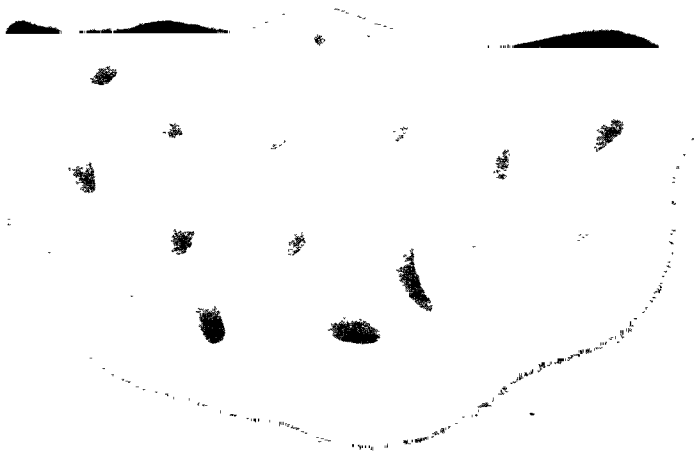
5



1. PEKA-PEKA, GREENSTONE.



2. PEARL SHELL PENDANT, MELANESIA.



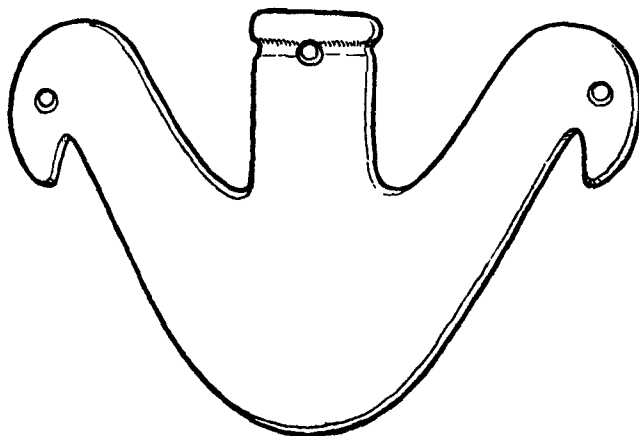
3. PEKA-PEKA, HUMAN BONE.



4. PEKA-PEKA, WHALEBONE.



5. PEKA-PEKA, GREENSTONE.



6. ANCIENT EGYPTIAN PALETTE OR PENDANT.



FIG. 1.
THREE CURVED WHALEBONE
PENDANTS.



FIG. 2.
CURVED BONE
PENDANT.



FIG. 3.
TWO CURVED BONE
NEEDLES.

FIG. 4.
THREE CURVED BONE NEEDLES.



FIG. 5.
CURVED PENDANT NEEDLE,
GREENSTONE.



FIG. 6.
NEEDLE PENDANT WITH KINK,
BONE.



FIG. 7.
DOUBLE CRESCENT
PENDANT.



FIG. 8.
CURVED PENDANT WITH KINK,
GREENSTONE.

uneven parts. It is suggested that from this or some similar type is derived the type of pendant exemplified by Fig. 7. I do not know whether any of the intervening steps are represented in collections. The specimen figured is in the Hocken Collection at Dunedin, but I think it is of northern origin, and modern. Fig. 8 is like Fig. 6, but made of greenstone, a beautiful piece brought home by Captain Cook. I have seen a clumsy greenstone specimen from Taranaki, now at the Dominion Museum, and a tiny greenstone one from D'Urville Island found by Captain Bollins. Bone examples are rare.

From the facts stated above, I think we are justified in concluding that the crescent and its variant form, the double crescent pendant, are, like the J-shaped and the straight types, native to New Zealand, and that none of them indicates foreign influence or origin.

5.—BROAD, SERRATED, BREAST PENDANT.

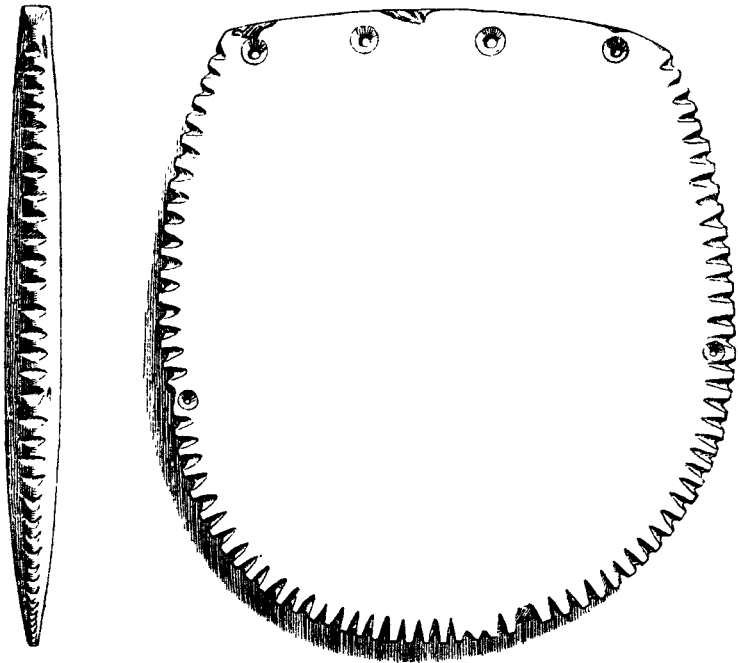


FIG. 1.—HEART PENDANT OF STONE.

Fig. 1 represents a type of breast pendant which is extremely rare in New Zealand. The writer has heard of an example in greenstone, but has not seen another, nor has one ever before been figured. The Maori name is not known. The specimen figured is in the collection of Mr. Edric Williams, of Otane. It is made of a dense black stone and comes from the western shore of Tasman Bay, New Zealand. Its greatest breadth is 6 inches, the vertical measurement from smooth edge to bottom being about half an inch greater. Its greatest thickness is about three-quarters of an inch. The four holes along the top edge are designed to take

the flax fibres of the string. The holes on either side were perhaps intended to hold tassels of feathers.

This type of pendant is more widely spread in the Pacific than any other. Throughout Micronesia, Polynesia, and the Polynesian fringe of Melanesia, it varies little in shape and is generally executed in whalebone. In Melanesia it appears generally to be executed in pearl shell. In this area its ancestry can be clearly traced to a single valve of pearl shell worn as a pendant on the breast. In view of present controversies it is perhaps worth noting that such shells were worn as pectoral ornaments in ancient Egypt.¹

The example figured bears a remarkable resemblance to the Fijian variety of this type, a resemblance so striking that no student can fail to recognize their close connection.

(*For full details of specimens figured see CONTENTS.*)

¹ See J. Wilfred Jackson, "Geographical Distribution of the Use of Pearls and Pearl-shell," *Manchester Memoirs*, vol. 60, 1916, No. 12, p. 5.

THE MAGIC OF THE KIWAI PAPUANS IN WARFARE.¹

By GUNNAR LANDTMAN, Ph.D., Lecturer in Sociology at the University of Finland, Helsingfors.

THE Kiwai people, who inhabit the district at the mouth of the Fly River, in British New Guinea, draw a distinction between two kinds of hostilities, the one being fought out between different septs of people in one and the same village or between related village communities, and the other between tribes which regard each other as hereditary enemies or otherwise make raids upon each other. In the former fights comparatively little blood is shed, although there is a great deal of noise and much interchange of missiles. These conflicts generally take place after sunset, and the scene is lighted up with torches held by the women. The fighting is sometimes renewed several nights in succession, but an armistice is generally kept during the day. However excited and enraged the partakers may look to a European spectator, and however savage their gestures and blows, yet on these occasions the fighters lay a certain amount of restraint on themselves, aiming their arrows at the legs of their adversaries or removing the sharp arrow-heads. It very rarely happens that a man is killed in these affrays, and no one fights in order to possess himself of a head.

The purpose of the real wars, on the other hand, is to kill as many of the enemy as possible, destroy their property, and capture the heads of the slain. The great expeditions are preceded by all kinds of preparations, which include magical rites calculated to ensure victory and help the warriors in capturing heads. Certain of the great ceremonies, which are also connected with the initiation of the youths, purport to make the latter fearless and invulnerable fighting men. This is the case with the *mimla* ceremony, in which the lads have to undergo a severe ordeal of fire, and the *mogûru* ceremony, which comprises a whole series of secret and awe-inspiring observances. But in addition to the important ceremonies the Papuans have a great number of minor magical practices accompanying all their doings while on the warpath, and some of these will be set forth in the present paper.

A man whose wife is with child cannot accompany his comrades to war. The

¹ Among the Kiwai Papuans hardly any universally adopted doctrines exist as to the details of spiritual and material life, but the ideas and practices of different groups of the people and even individuals vary to a great extent. This is naturally the case with their notions regarding magic, and in this paper I propose to give instances of native thought irrespective of whether they are characteristic of a greater or smaller number of people.

natives say that he is the maker of the child, and that "blood belong woman he run inside along man, make him no good"; and also, "woman he make him eye belong man no good." If the man should take part in a fight, he would be killed and his companions with him. The blood flowing from his death-wound is associated with that of his wife in childbed.

Before going to war a man must not cohabit with his wife, which under the circumstances is a bad thing, and may cause his death. During the days preceding a fighting expedition the warriors eat in the men's house, and at least in the notions of certain people must avoid having their food cooked by women who are used to sexual intercourse. The young warriors abstain from playing with the girls, and do not even speak to them.

Certain food should not be taken by the fighting men in time of war—for instance, turtle meat—and the reason is that the turtles are very shy animals ("he come up along water—run away," say the people). If the warriors eat turtle, the "bushmen" (as the inland tribes are called) will run away too. Dugong meat can be eaten, for the dugongs are not as timorous as the turtles, but venture near the men who wait for them on the harpooning platforms. Because of their ferocity sharks are the right kind of food in wartime ("he run for fish all same man he run for fight"), but certain other fish are "too soft" to be eaten by fighting men. The notions as regards food restrictions naturally vary to a great extent among different groups of the population in a village.

Fighting expeditions are undertaken either on foot or in canoes. In some cases the painted decorations of the canoes have a magical reference to fighting. One of the ornaments painted on the inside of a canoe represents a row of hearts, and they help the men to fight and "kill him man good." Another pattern represents sinews of the human body, and their effect is that "bushman he no can run away—he stop house—you kill him." A certain drawing which shows the breast-bone or shoulders of a man serves to prevent the bushmen from hitting the people with their arrows, and an inverted triangle, representing the tongue of a man, has reference to the shouting of the people when they have got hold of an enemy and kill him.

Before a fight the men paint themselves in red and black and sometimes light grey (with mud), and the methods and patterns vary very much. It is said that, at least in certain cases, the Kiwai warriors painted themselves in order to recognize each other in the fray of a battle, as the bushmen, according to the same statement, do not paint themselves for such occasions. A number of ornaments is worn by the fighters.

Various means are used for poisoning the arrows. In certain cases the arrow-heads are smeared with "grease" from a decaying human body, mixed with certain other "medicines," or the arrows are stuck into a grave till they come in contact with the corpse. Thus prepared, they are thought to inflict most deadly wounds. For the same purpose tresses of human hair are wound round the arrow-heads under the barbs, and it is said that young warriors in particular, the first time they have killed

a man, prepare their weapons in this way. Thus treated, the arrows will always hit the enemy at whom they are aimed. Some men collect a little blood from the pig which is used at the *moguru* ceremony, and dip their arrows into it. The same blood is used for preparing the handles of the beheading knives; this medicine, too, ensures success in fighting. Sometimes when a man has been killed with an arrow, his friends carry him home without drawing out the weapon. The body is placed on a burial platform, and after the flesh has rotted away the arrow comes off, and is secured by the people, who keep it till the next time they are fighting the same enemy; then they use it for avenging their friend. "Proper poison, that thing," they say, "grease he fast along [adherent to] arrow."

. A great importance is attached to preparing the young men before a fight, particularly if they have not killed anyone before, and for this purpose they are given various medicines. The ingredients of one of these medicines consist of small bits of the eye, talons, beak, and tongue of a certain large hawk. The eyes help the men to find the enemy, the pieces of the talons and beak to catch him, whereas the tongue of any animal, when it hangs out, represents the fury of fighting: therefore a piece of the tongue of a dog too is used for a medicine of war. Sometimes when an enemy is killed the natives cut off a piece of the skin above one eye and let the young men swallow a fragment of it, the explanation being that a man's brow is the foremost part of his body when he rushes at an enemy, and therefore in a way symbolizes fighting. It is stated that the terrified youths sometimes shrink from taking the dose ("he want heave him up that medicine again—too much fright").

The father and mother of a young warrior at times prepare medicine for him in the following manner: They have connection with each other close to the path in the bush, and collect some of the semen in a coconut bowl, mixing it with a little of the dried flesh and blood of an enemy killed before. The woman dips both her forefingers into the bowl, and then strokes the boy's eyebrows upwards with them so that the eyes open, and this will enable the boy to "find him bushman good." The mother also pushes the boy's heels upwards with the same fingers, and the boy "he run quick."

The penis of a slain foe is sometimes cut off, threaded upon a stick, and dried. Before a fight a small piece of it mixed with banana will be given to the young warriors, and this will make them successful in catching and killing male enemies. Máinou, one of the Mawáta leaders a generation ago, used to let the men drink his urine from a coconut-bowl in order to "make him more strong, all same fire inside," for the people say that "fight (fighting spirit) belong man he come all same fire." After killing a woman in war, the victor sometimes cuts out her vulva and passes it upon his arm, and when it has become dry, a small piece of it is administered to a young man with banana, and will give him luck in killing female enemies. Portions of both a penis and vulva, captured from the enemy, will help a warrior to kill men as well as women. The neophytes are often afraid to take the medicine, and in such cases the man who prepares it pushes it down their throats with his

finger. A piece of a woman's vulva swallowed by a warrior has also the effect of causing the enemy to be so occupied with their women at the time of the attack that they will fail to notice the approaching danger.

On leaving for war a man is sometimes given a medicine by his wife, consisting of a piece of ginger which she has kept for some time inside her vulva. In the fight he will chew a little of it, spit the juice on to himself, and call out: "My wife, all same *hurumiare* (a kind of lightning), straight where *de* (vulva) I go!" He spits first a little at his legs and the rest into his hand, with which he then draws his eyelids upwards, forcing his eyes wide open; this makes him "find him fighting man." If instead of ginger a certain plant named *mānabāba* is used, a woman will be killed instead of a man. "Every time I kill him man," a warrior may think, "more better I kill him woman now."

The effect of a fighting medicine which a man has taken hardly ever ceases, and may break out over and over again, even after a considerable time has elapsed. "Strong (strength) he come," the natives say; "man he go kill him bushman—he come back—he go steal him woman belong other man"; for the effect of the powerful medicine may express itself in many ways.

Scarification marks have in certain cases magical reference to war and fighting. This is the case with the pattern representing a poisonous centipede, which is sometimes scarified on the right arm of a young warrior. The blows which he deals out are associated with the centipede's bites, and the scarification "helps" the man in fighting.

The following rite purports to protect the warriors at the same time as it causes the enemy's destruction. An old woman lies down on the floor in the men's house with her head directly towards the east, where the sun and moon rise. An old man stands over her straddle-legged, and places on her vulva an *ibāia*, a certain amphibian which moves with a curious limping action, as if continually falling down and rising up again. The movements of the *ibāia* are associated with those of a wounded man who tries to walk, but perpetually falls down. The warriors crawl on their hands and feet between the legs of the old man, and the first of them puts his right hand (with which the enemy is caught) upon the *ibāia*, seizes it, and then jumps up and walks a few steps away in the direction of the rising sun. After him the other men do the same thing. Then the woman quickly changes her position, so that her legs are directed towards the east, gets up facing the same quarter, and then turns round. This movement has the effect of protecting the men, so that they will return from the fight unhurt by the enemy's arrows, while the enemy himself will be destroyed.

A series of magical observances has the object of causing havoc among the enemy from a distance before the actual fight. In one of these rites an old man will chew a little ginger and squirt the juice out in the direction of the enemy, saying: "*Hurumiare ragurubai káátáto áiáto rée órohoriúti hurumiare mádo mío hirío réétói*" ("All same I go for wife, straight for thing belong wife; all same I go for that fighting place, body belong me all same *hurumiare* [lightning] he go").

This opens the way to victory for the rest of the people too. The man may sometimes utter a certain formula to some object, which he holds in his hand and then throws away in a certain direction; thereby he indicates the quarter from which through his action, some event will so occupy the enemy that they will be off their guard. The object to which the old man addresses his formula may also be quickly placed on the ground, and this action causes the enemy to "lay down their heads beforehand, as when they will be felled in the subsequent fight." Sometimes an old beheading-knife is addressed in this way, and at the same time it is thrust to and fro in the direction of the enemy, as when cutting off a head. All these rites make the enemy strengthless and incapable of resisting the attack.

Some men can send their spirits out beforehand to conquer the spirits of the enemy, and after that victory will be certain. This kind of preparatory magic is called *biamai*. Sometimes a dried penis and vulva are inserted into each other and placed on the path leading to the hostile village. An old man spits a certain medicine at the two things as well as the path on the enemy's side, and says: 'Man (the enemy) he fast [copulate] along that thing that time me fellow come. He look *ae* (vulva) all time, no savy look out.' Then the old man lies down on the path, and the warriors stoop over him, bending down in the direction of the enemy's camp and shouting in a harsh voice, "Oo-wii!" The old man and his wife lastly lie down side by side on the path motionless, thereby "teaching" the enemy, who soon will lie in the same way under the influence of the *biamai* sent upon them by the old couple in order to make them "lazy."

Máinou, the Mawáta leader, once bewitched the enemy before a fight by means of a bivalve, which he treated in the following way. He opened the shell, and, holding it in his hand with the gape facing the enemy, said: "*Ípa óbere igodía nánito írimo ópai nánito*" ("You swallow him bushman, shut him mouth"). Then he quickly closed the two sides of the shell, turned the back of it towards the enemy, and tied it up with string. Through this manipulation the souls of the enemy were as if shut up in the shell, and victory was sure.

Once when the Mawáta men and some of their confederates went to fight the Táti bushmen, they performed the following rite on their way, and the place chosen was just beyond the parting of the paths to Bádu and Táti, for otherwise the magic might have taken effect the wrong way: Some sago leaves were spread on the road, and four old women lay down on them nude with their heads in the direction of the enemy. Two old men, who conducted the rite, squirted out a certain liquid medicine over the women's vulvæ, at the same time breathing out, *Ha puh! Ha puh!* In the vapour thus produced the two old men saw a certain apparition, and said to the people: "You me (we) all right; bushman no kill you me." Then all the fighting men in turn went up to the women, and with their right hands smeared the edge of their weapons with secretion from the women's vulvæ, the effect being that every wound inflicted with the weapons thus prepared would kill an enemy straightway, "no matter hit him small." The right hand was used for applying the medicine, for "that hand he belong fight, kill him man; left

hand—that nothing.” After performing the rite, each partaker withdrew from the spot by stepping forwards, and in no case should he turn round, for if he did so he would forfeit his luck. Everyone had to be silent and abstain from spitting or making water, or the others would kill him. The four women could not go back to the village after the conclusion of the rite, for that would cause harm to the people, and therefore they accompanied the warriors on the expedition and cooked food for them.

The skull of some departed tribesman can be used in the following way for destroying an enemy: The officiator spits some medicine on to the skull, which he hooks on a suitable branch of a tree. He then bends the branch sideways as far as he can, lets go, and the skull is hurled away with great force, the direction aimed at being that of the hostile village. At the same time the man calls out: “Father (or whomever the skull may have belonged to), you go kill him bushman!” the enemy’s name too being given. If this method is put in practice against an individual enemy, which sometimes happens, he will at once fall down, begin to vomit, fulfil his wants involuntarily, and die.

Once it happened that a party, before attacking a hostile village, captured and killed a woman of that place. Then some men lifted the dead body up in a horizontal position on their hands, the head turned towards the enemy, and repeatedly swung the woman to and fro in that direction, thereby causing the hostile camp to “sleep good”, so that no one should escape.

If a fighting party does not find the enemy at once, they have various methods of ascertaining the place where the latter dwell. Some man versed in these practices constructs a kind of roof, under which he goes and stands. He prepares a medicine and spits it out in some certain direction, and if that happens to be the right side, his heart will at the same moment give a start. If there is no such response, he repeats the experiment until the right direction is found. The men proceed along the indicated way, and by renewing the trial they can locate the enemy’s whereabouts.

The natives take note of a great number of omens when desiring to foretell the issue of a forthcoming fight. If on an expedition they see a snake crawling across their path so as to cut their line in two, they conclude that they have to be on the look-out for the enemy, for the latter are themselves on the move, unknowingly approaching the marching line at the same angles as did the snake. If the snake crawls against the people on the path, the enemy will meet them unawares, but if the reptile moves in the same direction as the people, the enemy will not be found at all.

A certain bird which is heard producing a rattling sound, while the men are on the march, forebodes the capture of a great number of heads (“by-and-by them fellow [the enemy] sing out [rattle] all same”). It is a good sign, too, if no birds at all are heard, for that suggests the silence which reigns in the hostile village after a victory (“by-and-by me cut him head—no more noise”). But if many birds are heard clamouring in the bush, no enemies will be found, for they will wake up

prematurely and flee away with as much noise. Before a fight, if a newly captured fish is found to be in a soft and almost decaying condition, the people will think, "Oh, he rotten now, too much fly he come. Somebody come kill you me (us) now." A fish which flounders up when put on the fire means, "Fighting man he kill somebody belong me fellow; ghost he jump all same." Sometimes a fighting party while travelling in their canoes will see a shoal of fish swimming with their heads down and tails uppermost, and then they think it better to return, for otherwise they will be killed. If the people, on looking at their reflections in the water which has collected at the bottom of the canoes, see there some head-carriers sticking out from their mouths, they will go back home, else they will be killed, and their heads threaded on the enemy's head-carriers.

When resting in the night a fighting expedition will sometimes tie up their paddles into a bundle in order to find out what success they will have. The following morning one or more of the paddles may be found in a different place some distance off, although none of the men has removed them. The people will find out who the owners are and say to them, "You look out! *Ur'io* (spirit) belong you been take him out paddle, put him along other place. You no go fight, you stop along canoe." If the men thus pointed out nevertheless take part in the fight, they will be shot by the enemy.

Sometimes at sunset the warriors see in the sky the apparition of a tall man who carries a bow and arrows and is decked with the usual accoutrements of war. That is "mark belong dead", which presages the death of some of the people, and therefore the party returns home at once. If the moon is very red previous to a fight, the people will think, "Ah, he (the enemy) kill me fellow, he kill me all," and they go back.

In order to foretell the result of a fighting expedition, an old man and woman may withdraw into the bush, where she takes off her grass petticoat and lies down on the ground. If the man then does not feel "strong along woman" he advises his companions to return home, for there will be a defeat, but sexual excitement on his part means a victorious fight. Another device is that the old man smokes a pipe, inhaling the smoke into his lungs. If he chokes, the people must go home, for the omen predicts that they will have to run till they are breathless, with the enemy in pursuit; but if he manages to blow out the smoke easily, they will make a successful fight.

While the warriors are away, the people remaining at home consult various signs, which enable them to judge of the luck or failure of their friends. On the bank of the Ábereóromo creek in Kiwai there grows a tree which in time of war lets the people at home know if any disaster befalls those of their number who are out fighting. In such a case the tree bends down towards the ground, and the leaves begin to tremble.

Before going to war the people sometimes hang a skull with the jaw intact on a tree and spit a certain medicine on to it. While the fight is in progress the skull at home gnashes its teeth and rocks to and fro of its own

accord, and by watching its movements the people conclude which septs of them will capture heads and which not.

When the people on a war expedition sleep before a fight, it is the custom that some old men sit up all night to watch over the canoes. These may see the souls of the sleeping warriors and hear them knock against the canoes. Some of the phantoms stand up on the canoe platforms carrying heads, and the watchmen see who they are. In the morning they tell the warriors which of them will capture heads in the forthcoming fight, and the men will eagerly exclaim, "Ah! by-and-by I go fight!" If the watchmen in the night see a row of phantoms passing by as if coming from the enemy's camp, this means victory, and the apparitions are the spirits of the warriors returning from the fight with a spoil of heads. But if the spectres move in the opposite direction, they are the spirits of the enemy who are going back, carrying the heads they have captured.

It is very important that the people staying at home during a war expedition observe certain rules of conduct, for their behaviour is by no means immaterial for the success of their fighting friends, whom, on the contrary, they can help or injure from a distance. In the absence of the warriors the few old women who are associated with every men's house must keep some fires burning in the house in order to keep it "warm", or defeat is sure to follow. The whole village must be silent, for otherwise the enemy will be warned prematurely (as if hearing the noise) and run away. Therefore the women at home only do the most necessary work. They also have to restrict themselves to certain kinds of food. Fish and turtles are forbidden on account of the shyness of these animals, but dugong can be eaten, for they do not flee so easily. Coconuts must not be husked or broken near the house, only in the bush, in order to avoid noise. A woman must not even wail, if she feels sad when thinking of her absent husband. It is particularly bad if someone "humbugs" the wife of a warrior during his absence in a fight. The latter is sure not to catch any bushmen, but will very likely be killed himself.

The fight itself usually takes the form of a surprise attack on the hostile village, and the hour as a rule chosen is just before dawn, when every enemy is thought to be asleep. Neither age nor sex is spared in the wars; the enemy's property is destroyed excepting what is carried away; his domestic animals are shot and coconut trees cut down.

The cutting off of the heads of slain enemies is sometimes accompanied by certain magic observances. Old Máinou of Mawáta used at times to cut off heads in the following way. He forced an *ibáia* amphibian (see above) as far as he could down the throat of the enemy whom he had disabled or killed, and thus in severing the head he also cut the animal in two. "That fashion," said my informant, "make him bushman 'cranky', not see him fighting man." From the effect of the *ibáia*, which, as we have observed, moves in a peculiar, staggering manner, the enemy cannot run away from their pursuers.

When an enemy has been caught by a warrior, the latter sometimes does not kill him himself, but calls some young relation to come and administer the

death-blow, for he wants to teach the young man how to do it. Then on cutting off the head the elder man smears the boy's face with some of the blood and says, "Next time you come fight you kill man yourself." After that the young man will become a great fighter, who will never fail to catch an enemy, for "that blood been go along face." If a young boy shrinks from slaying a wounded enemy whose "eye stand up, look man", his father or some old warrior will command him to do so, saying in a harsh voice, "Go on! I been kill him, you kill him finish, you no fright!" And the boy, still terrified, will deal out the blow and then recoil once more. After a fight a warrior washes the blood from his arms and hands, excepting that on his finger-nails, which he purposely preserves by closing his hands when washing. After returning home he scrapes off the particles of dried blood from his nails and keeps them in a dry leaf for future use. On some suitable occasion he administers the blood to some boys, who then on growing up will become great warriors.

The people seem to regard it as hopeless to pursue a fugitive enemy after he has got a start, and the only thing they do is to shoot off their arrows in his foot-prints or perform some other act which is thought to hurt him from a distance.

In the excitement of a fight the soul of a man may "jump out of his body". The natives say, "That time you kill man, you lose sense altogether, no think about woman, pickaninny house. *Urío* (soul) go away, he play like pigeon (bird in general). Body belong man he go fight, kill him man; *urío* belong man he fly about on top." The soul generally comes back during the sleep after a fight, and on the return of a war party there is an additional observance which purports to restore the soul to its normal state. An old woman unties the string with which her grass petticoat is fastened, and hands the end of it to the men as they land from the canoe. She leads them, three or four at a time, on shore and from there into the house, still holding the string and going herself backwards. At the door she pushes the men in one by one, and "*urío* come too, come back".

The natives say that a warrior after a fight is never afraid of the ghost of an enemy killed by him. Certain rites, however, seem to indicate a desire of freeing oneself from pernicious influences which may infest a man who has been stained with blood in a fight. He provides himself with the stem of a certain creeper called *úereúere*, which has very sharp leaves and fibres, and splits up part of the stem, leaving both ends intact. Walking a few steps out in the sea or a swamp, he passes the split-up creeper over his head and body to the waist. Then he turns round towards the shore, at the same time cleaving the creeper completely, throws away the two parts of it behind himself, and kicks some water backwards with his foot. This action rids him from whatever evil may follow him; he "washes the blood away," as the natives say.

There is a belief that a man whose head has been cut off turns into a certain malignant being, although the slayer of the man need not fear it more than anyone else. This being is called *úumú*, and the blood which has spurted out from the

gash in the neck shines at night like a fire. People have fallen a victim to an *útumu* by mistaking its light for an ordinary fire.

Various rites are performed immediately after a victorious fight, their object in most cases being to give some powerful "fighting-medicine" to the young men. In one of these rites the captured heads are placed in a row on the path, and the great fighters go and stand over them with their legs wide apart and their backs turned towards the place where the enemy have been slain. The young men crawl on all fours between the lines of legs in the direction which the men are facing, and each of them is guided by some old male relative, who walks abreast with him on the outer side of the row of men. The old man holds in his hand a piece of ginger, and rubs with it the forehead of each of the severed heads (which lie face upward) and also his own forehead. On reaching the end of the row the boy is given the piece of ginger to swallow, and after that he will never be afraid of anything. Every young man goes through this rite only after his first fight. Gaméa, an old Mawáta man, told me how he had been through the rite in his youth, and how terrified he had been. "Oh, smell belong head and blood he too bad," he said. "Me no can go, heave up." "No good you heave up," grumbled the people, and pushed him down as he hesitated to crawl over the bleeding heads. He was commanded to bite the brow of one of the heads belonging to one of the great fighters of the enemy, lift the head up with the teeth, and then put it down again. A small piece of flesh cut from the gash in the neck of the same head and a piece of a certain plant were chewed by the great man who initiated Gaméa in the rite, then he spat the juice into Gaméa's mouth, and the latter had to swallow it. At the same time the initiator stroked his hand down Gaméa's throat and chest, thereby forcing the medicine down into his stomach. Each one of the initiates had to lift a separate head in this same way, for if the same head had been used by all, the result would have been that in subsequent fights several men would have killed only one and the same enemy. No heads of female enemies were used in the rite, for if that had been the case the initiates would have captured female enemies only in the following fights.

The people try to bring home those of their own number who have fallen in a fight, and place the bodies on the canoe platforms, face upwards. The captured heads are usually stored under the platforms, but sometimes the surviving friends place them round the dead bodies, thinking thereby, "You all right; me been kill him plenty bushman."

On nearing home the people on board sound their trumpet-shells, first calling the attention of their friends at home with a long signal, and then giving the number of the captured heads with as many short signals. The women in the village dress up and perform a dance called *nékede* on the beach, and the men in the canoes stand up carrying the heads and singing a song called *pípi*. A series of rites and feasts takes place at the return of a war-party, and some of them have reference to the preparation of the captured heads. The warriors paint themselves red and light grey. The heads are hung up over a fire, the hair is torn away with

a forked stick, and when the flesh has come off the skulls are washed and dried. On the same occasions the men warm their shoulders and elbows at the fire, "for that thing he go for kill him man," as my informant said, making a great gesture with his shoulders and elbows. After handling the heads, the people paint their hands and forearms red as far as the elbows, and they use small sticks when eating, as they do not want to touch the food with their soiled hands. In Dibirí, the country east of the mouth of the Fly, the people are said to eat the skin, flesh, and eyes of captured heads, and while preparing the skulls to keep them under their sleeping-mats as head-rests. The blood is sprinkled all over their houses. The neighbours of the Dibirí natives also impute to them the custom of drinking blood fresh from the arrow-wounds of disabled enemies after jerking out the weapon.

After the skulls have been dried they are hung up in the men's house, except the jaws, which are kept by the captors. Sometimes the genitals of the man or woman killed are dried and attached to the skull for the purpose of indicating its sex.

If one of two fighting tribes desires to make peace, they let their wish be known by blocking the way to the enemy's village with a branch which they put across the path, and choose for this purpose some parting of the road which the enemy are sure to pass. In the case of the enemy agreeing to the proposition, they place another branch over the first one, but if they want to go on fighting they turn the branch so that it points in the direction of their antagonists, and place on it a bundle of small tally-sticks, which indicate the number of people they intend to kill before they are willing to make peace.

If a strong party of warriors meet a small number of the enemy, hardly any sign or friendly hailing whatever will prevent the latter from running away in fear of treachery. Certain signs and tokens are, however, meant for conveying the friendly intentions of a stranger or enemy, as, for instance, untying the bowstring or carrying the bow behind the shoulder with the string passed under the opposite arm.

The usual way of making friends is through the medium of the women. A couple of men with their wives go to the hostile village, and the women are sent a few steps in front. It is a recognized rule in the district that the presence of women in such a case means peace. Such a proposition to cease hostilities is generally accepted—at all events temporarily—and the visitors are well received. The men mutually break each other's beheading-knives in token of peace, and sometimes exchange their arm-guards. In the night the men in the village have connection with the women of their guests, and that is the real object of the visit. This custom is called *éra adógo* ("put out the fire"). After a few days the visit is returned under exactly the same circumstances, and the visitors give up their women to the men in the other village. The men drink *gámóda* together, which is a narcotic beverage obtained by chewing the plant of the same name (evidently the *Piper methysticum*). During the drinking-feast one man of each side will sprinkle a little *gámóda* over the assembled people, and say: "No more fight now, no good you me (we) fight."

This rite is called *karéa*, and is performed in an analogous way on a number of different occasions and for different purposes.

At the conclusion of peace, payment is generally given for those who have been killed in the fights. The compensation for a man generally consists in giving a girl in marriage to a brother or some other near relative of his, the idea being that in the course of time she will bear a child which on growing up will fill the place of the dead man. A great number of things are interchanged between both sides by way of additional payment for the dead, and the occasion is celebrated with dances and feasts.

THE KABIRI OR GIRARA DISTRICT, FLY RIVER, PAPUA.

[WITH PLATES XIX-XX.]

By A. C. HADDON.

THE Kabiri or Girara District is the low-lying country between the Fly River and the Aramia affluent of the Bamu, and extends for a short distance beyond the Aramia. Roughly speaking, it extends from about east longitude $142^{\circ} 30'$ to $143^{\circ} 15'$. It is flooded during nine months of the year, but there are innumerable low hillocks and ridges, some of considerable extent, on which coconut-palms are planted wherever there is room for them. The villages are on hillocks, between which communication is made by means of very long, narrow canoes of shallow draught. There are very large sago swamps; indeed, according to Mr. Beaver,¹ there is a plethora of sago and coconuts; he adds that yams, bananas and sweet potatoes are cultivated, but not to any great extent. Fish abound in the swamps, and are caught in large conical traps made of cane, something after the style of a lobster pot [these may be at least 152 cm. (5 feet) in length].

Bird life is abundant; birds of paradise, goura pigeons and cassowaries are plentiful. The swamps contain many varieties of waterfowl.

Mr. Lyons² states that the Kabiri (as he terms them) live in some twenty scattered villages from Taitiarato in the east, on the Fly littoral, to Domori Island and to just north of the Aramia River. He describes the people as distinctly of Papuan type and of fine physique. The men as a rule go nude, as do some of the women, whilst others wear a narrow perineal band. Mr. Beaver says the majority of the men wear a conical fibre hat, decorated with feathers, or else a skull cap of network (Fig. 2). The hair is shaved above the forehead, and a small corkscrew goatee beard is worn. [Mr. Beaver illustrates these facts by a photograph.] Mr. Lyons says all the males adopt the *diba*, or conical hat, which is affixed to the hair of the head by some glutinous mixture; the hat is not removed even when sleeping. Generally the outside of the hat is covered with white lime, and the top is made a receptacle for feathers. Mr. Beaver says the women cover the head and bosom with a veil of net. "This is stated to be a mourning dress, but so many of them wear the veil that I can hardly believe it is entirely mourning."³ Their other dress is rather scanty, and consists of a wisp of grass drawn in tightly between the legs. . . . The Girara (as he terms them) emphatically deny being cannibals, but admit head-hunting. . . . They have five totems, which descend from father to son. These are the pig, the pigeon, the alligator [crocodile], the black snake and the cassowary." They claim descent from a dog (Beaver, in a newspaper interview).

¹ *Ann. Rep. Papua*, 1911-12, p. 11.² *Ann. Rep. Papua*, 1913-14, p. 99.³ Landtman has no doubt that these caps are solely for mourning.

According to Mr. Lyons, the villages usually contain only one house, which is of immense size, measuring anything from 18·29 to 39·62 m. (60 to 130 feet) in length and from 50 to 60 feet in breadth. [In a newspaper account Mr. Beaver is reported to have said that the houses were sometimes as much as 121·92 to 152·4 m. (400 to 500 feet) long and 18·29 to 24·36 m. (60 to 80 feet) in width.] These houses, which are built on high piles, are well constructed and last for many years. The roofs are high, arched, thatched with sago leaf, and extend to the ground along each side. Compartments are made at the sides of the houses for the accommodation of the women and children, who are not permitted, except on certain occasions, to enter the men's portion of the house (*genema*). The women enter their apartments from underneath the house. [Mr. Beaver says: "The centre of this huge building is a kind of common hall, which is used only by the

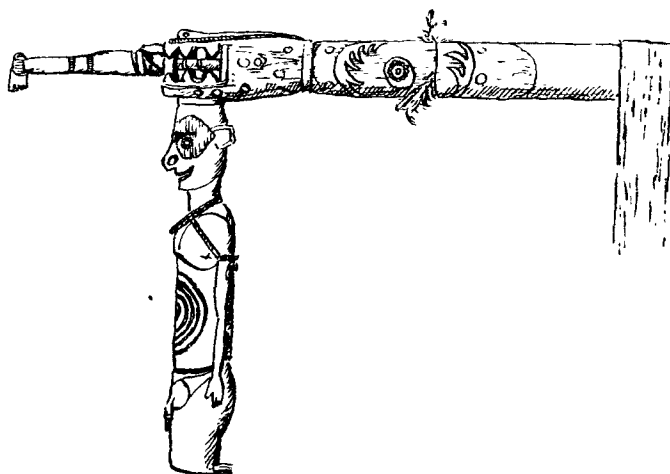


FIG. 1.—Chief post (1·3 m. ; 4 feet 3 inches) and chief joist (2·06 m. ; 6 feet 9 inches) of a Kabiri house in the Port Moresby Museum. Collected by A. P. Lyons at Adiba. From a sketch by Mr. Lyons and a photograph taken at Port Moresby.

men, while the walls of the structure are divided into cubicles in three or four floors, access to which is gained by means of ladders. The women are not allowed to enter the building by the same door as the men."—Newspaper report.] Even the single men are restricted to their own end of the *genema*. Married men alone have access to all parts of the house, and, in fact, to everything connected with the ceremonial rites of the tribe. The married men's end of the house is called *mana*.

The following information is taken from Mr. Lyons' report, supplemented by his manuscript notes. When a suitable site has been selected for a new communal house, the village carver is deputed to prepare the chief post (*timi*), and the "chief bearer," or joist (*idadari*). The former is either a carving or a painting of the principal chief. The ends of the chief joist are carved to represent the heads of crocodiles swallowing either birds or human beings; usually the head or legs of a man are represented as sticking out of the crocodile's mouth (Fig. 1). Whilst these

are being made, the women and children prepare food for a feast. When all is ready, the people assemble; the chief (*wasina*) places the chief post in its hole, other piles are placed in alignment with it, and the chief joist is placed on them all: these will form the middle supports of the house. The *wasina* names the village, and there is much feasting and dancing. When the house is completed, which often takes many months, another big feast and dance are held.

In a letter dated October, 1910, and privately printed, the Rev. B. T. Butcher says all the villages are built on the same principle—a great house (that at Mida, or Kubu, is about 200 feet long and 40 feet wide) with a central hall, which runs the entire length of the house and is reserved for the use of the men; on either side are the walled-off private apartments. These consist of three storeys. In the lowest of all the cooking is done, the middle one is for the women and children, and the top storey for the men. The women do not come into the central hall, but reach the cooking and sleeping apartments from underneath the building. The men reach the various storeys by means of notched logs which rest against the side walls of the hall. The only light in the hall filters through various holes and chinks in the walls and the small doors at either end. There are no windows. The houses are very high and with an average width of 50 or 60 feet; they are raised 5 or 6 feet from the ground on piles. The floor is made of strips of palm trunks laid side by side and forming an undulating surface. Illumination is made by means of little lighted sticks (*wiki*), which burn slowly and need constant snuffing, which is done by knocking off the charred portion. The house at Barimu is about 450 feet long, about 50 feet wide, and 30 to 40 feet from the ground at the gable. Here Butcher saw the men seated in a circle round their chief, who was beating time with a lighted *wiki*. Each man had his betel nut and lime gourd by his side, and a lighted *wiki* in his hand with which he beat time in unison with the chief, while boys were chewing “gummada” (kava) for the men’s use. One very old man repeated the first word or two of every line of a song before it was sung, then all joined in a weird, musical, deep-toned chant, which ended with a most quaint cry of “Wa! Hi!” twice repeated.

Butcher says that along both sides of the house at Barimu a straight row of fine crotons was planted, then came a broad road, 15 or 20 feet wide, and beyond this a line of nicely arranged and beautifully kept gardens. Lyons further states that a clear space of about 60 feet is left all round the *genema* for dancing. The gardens are made beyond the dancing ground; these are long, narrow, rectangular beds of heaped-up earth, finely broken up; paths 10 or 11 feet wide are left between the beds. Coconuts, taro, and a yam called *wisa*, are planted. An old village usually presents a pretty sight, being surrounded by tall coconut palms and the clean red clay of the dancing ground. The approaches to the villages are also bordered by coconut palms. The roads between the villages are wide and well kept. Here and there along the sides of the tracks are to be seen trees marked with strange hieroglyphs, which denote the boundaries, either of the village or of an individual villager’s land.

The women are occupied in making their huge fishing nets (? traps), in fishing, and preparing sago. The men cultivate the gardens, are fine handicraftsmen and excel in carving (Lyons).

Though a bush tribe, they have plenty of use for canoes during the wet season, when the hollows are filled with water; the waterways thus formed extend for many miles in all directions.

According to Mr. Lyons,¹ the principal ceremony of these people is the *moi-iata*, five of which are held during the wet season. In connection with the ceremony three large carved wooden crocodiles, known as Posia, Getehidi and Moi-ira, together with a number of minor articles, are used. When not in use all these objects are kept in a house, called the *kakanipa*, which only certain married men may approach. If anyone else did so he would be eaten by a crocodile, which is sacred to these people.

When it has been decided to hold a *moi-iata*, a small boy suddenly disappears from the village. It is given out that he has been taken by a crocodile who was angry with him for approaching the *kakanipa*. There is much wailing, and the bereaved parents approach the *samu*, or chief sorcerer, and ask him to implore the crocodile to restore their lost boy, who promises to do what he can. All the unmarried men, women and children are sent away to make sago and collect coconuts for a big feast to propitiate the crocodile. Whilst they are away, the Posia, Getehidi and Moi-ira are removed to the *mana*, or married men's end of the *genema*. To the head of each of them is affixed a huge cane effigy of a crocodile's head. All of them are then plastered with clay. The boy, who was supposed to have been taken away by a crocodile, but who actually had been blindfolded and taken away by night into the bush, where he was hidden by the *samu*, is then placed inside the cane mouth of the Posia. A fence is erected round the effigies to keep off too-curious persons. When all is ready, the *samu* and his assistants don grotesque masks and beat loudly on drums until all the villagers return. They are invited into the *genema*, when, with many incantations, the lost boy is dragged from the mouth of the Posia. Of course, payment is required for the restoration of the boy, which the parents are glad to make. Then follow dancing and feasting in honour of the mighty crocodile, and marriages are celebrated.

The following account of the material culture of the Kabiri is based mainly on the interesting collection which Dr. G. Landtman generously presented to the Ethnological Museum at Cambridge. Most of these he obtained in 1910 when travelling with the Rev. B. T. Butcher, L.M.S.; he also gave some specimens to the British Museum. The former will be referred to by an "L," and the number which follows is that in the Cambridge Collection.

There are two main varieties of caps, the rigid and the netted conical cap (*diba*), Kubu (Fig. 2 A, B). The foundation of these caps is a strip of ratan, which is produced into a continuous spiral, each whorl being lashed to that below and above

¹ *Loc. cit.*, p. 100.

by a band which is twisted transversely across itself between each whorl. The apex is hollow, and is produced into a broad ring, the outer edge of which is protected by a plait of split ratan. The whole of the outside was originally covered with black beeswax (?), and portions of the wearer's hair still adhere to the lowermost whorl. A smaller specimen (L 38) is covered with red clay; height, 18.5 cm. (7½ inches); diameter, 11.1 by 12.9 cm. (4½ by 5 inches). A similar cap, *gugu*, was collected by J. Chalmers some twelve years ago, and is now in the British Museum, the ratan base of which is served with bark fibre. Inserted in the apex are five mounted cockatoo feathers, the stems of which are threaded through a number of dark red lenticular seeds (Partington says *Pandanus* seeds), and there are a couple of white feathers cut into a series of V's. Height about 23 cm. (9 inches).¹

Netted cap for mourning, *atima*, Gaima (Fig. 2 C, D), of two-ply string made of the inner bark of some plant. The cap is not finished off, and as there is a small supply of untwisted strips of the bark in the inside of the apex, it is probable that the cap would have been somewhat longer. The stitch is of a simple character, and is shown in Fig. 2 D. There are in the British Museum two netted caps, "*atima*, worn by bush tribes of Obere when fighting and dancing," one of which is said to be worn inside the other; they are worked in horizontal bands of different widths, which are painted black, white, yellow, and red. The outside one has a tuft of cockatoo or *P. raggiana* feathers, and is about 38 cm. (15 inches) in length; the other is about 31 cm. (12¼ inches).² Partington also figures a "network cap (*atuna ata*) from Obere, worn when in mourning for parents or wife."³ These were also collected by Chalmers.

Three plumes for headdresses were collected at Gaima by Landtman. Fig. 3 A is a thin piece of light white wood, 187 mm. long, cut in the shape of a feather, painted black and red at the base, mounted on a quill, half of which has been cut away longitudinally for more than half its length, the whole end being stuck on a wooden splinter; B, cockatoo feathers stuck in a disc of blackened pith; on one side a red and green parrot feather, and on the other two notched similar feathers, mounted on a quill of a cassowary, part of which has been shaved away; total length, 35 cm.; greatest breadth, 17 cm.; C, two cockatoo feathers inserted in an elongated lump of black beeswax (?), in which are inserted several *Abrus* seeds, and mounted on a strip of ratan, the upper part of which is considerably thinned down.

Three water buckets (L 374-6), *maripa*, Gaima, of palm leaf (? *Ptychosperma*) folded in the usual manner, with a stick passing longitudinally through the folded ends and a loop handle of ratan.

Water vessel made of one internode of bamboo (Fig. 4); simple incised design of three concentric incomplete circles within two ovals. Stopper of doubled-up palm leaf. Gaima.

¹ Cf. *Album II*, Plate 192, No. 2.² Cf. *Album II*, Plate 191, No. 3.³ *Loc. cit.*, No. 2.

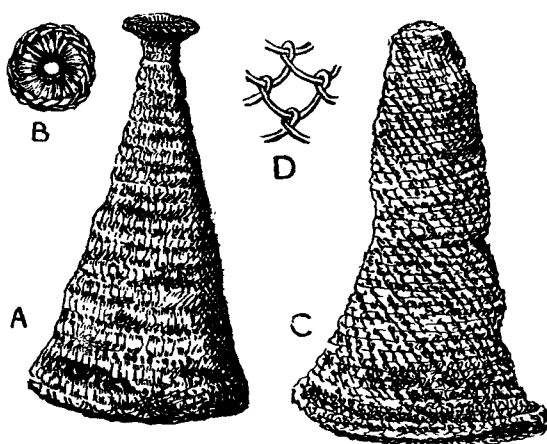


FIG. 2.

A, conical cap, Kubu (L 37): ht. 24.5 cm. (9½ inches), diam. 13.6 × 1.47 cm. (5¼ × 5¾ inches); B, apex seen from above; the cap was cut off from the hair with great difficulty. C, mourning cap, Gaima (L 1): ht. about 36 cm. (14¼ inches), circ. at base about 52 cm. (20½ inches); D, detail of the netting.



FIG. 3.

Plumes for headdresses, Gaima:
A (L 61), B (L 62), C (L 63).

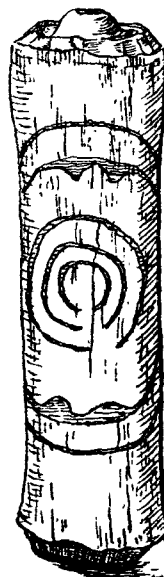


FIG. 4.

Bamboo water vessel, Gaima
(L 227): l. 44 cm., diam. 98 mm.

The canoes are very long, narrow, of shallow draught, and without an outrigger; they are carved and painted in an elaborate manner (*cf.* photo by Beaver).¹ Butcher refers to one about 21 m. (69 feet) long and 61 cm. (2 feet) broad, "carved from end to end and quite elaborately painted."² Lyons says the canoes are dug-outs; one measured 21.33 m. (70 feet) long by 1.14 m. (45 inches) in beam; the prows are carved to represent crocodiles, and along its sides "they usually carve figures of fishes, birds, or crocodiles. The paddles are exceptionally well made. They have a spoon-shaped blade and long handles with men's heads carved at the ends. The blades are marked in pigments of variegated hues. Each family has its own mark so that the ownership of a paddle is easily ascertainable."³ Our paddle (Fig. 5 B) is of light-coloured wood. The elongate spatulate blade is 83 cm. long and gradually widens from 45 mm. above to 154 mm. at a distance of 106 mm. from the end; one edge is very slightly curved. The blade is slightly concavo-convex, and the stem of the handle is prolonged on each side as a prominent keel to the end of the blade. The handle is approximately round, with a cylindrical head which is oval in section, the narrow end being on the same side as the broad part of the blade. The convex surface of the blade is painted black, white, and red; below, a human face is represented, and above are what appear to be the jaws of an animal. The under surface of the blade and the handle are coloured chocolate red, the head of the handle is white. I obtained at Wododo, Dibiri Island, at the mouth of the Bamu three uncoloured paddles like those described by Mr. Lyons.

The spear, *kibiri* (Fig. 5 C), is of heavy palm wood, roughly made, blackened, and flat oval in section. The barbed portion begins with a bead, and there are about sixteen rows of small barbs which appear to be arranged in an irregular spiral. It gradually increases in diameter from the point to the butt.

The two wooden war clubs are of very different types (Fig. 5 A, D): A is of heavy wood, length 1.54 m. (60½ inches), greatest diameter of head 50 mm., average diameter of handle 22–25 mm., approximately round in section, a flattened bi-convex button on the top. Upper portion with eight grooves, with sharp edges between them, painted with simple designs in black, white and chocolate red, ungrooved portion chocolate red; the grooved about 63 cm. long. D, *gabira pira*, is of dark heavy wood, length 1.21 m. (47¾ inches); head 122 mm. long, 61 mm. diameter, round in section, with five whorls of six teeth; a conical swelling at the handle end with convex base. Sling loop of red calico.

The undecorated dagger from Gaima of casso wary leg bone is over 37 cm. in length.

The two bows, *gagi*, Nos. 773, 774, are of black palm wood. L 773 is 1.89 m. (74½ inches) long, plano-convex in section, the convexity being produced into a slight keel near each end; between this and the spike for the string is a slight swelling or imperfect bead. The spikes of 773 have a collar of plaited ratan. L 774 is 1.93 m. (76 inches) long, and the flat side is slightly concave, there is a lenticular bead at each end below the spike. In both the flat side is at the outside of the curve.

¹ *A.R.*, 1911–12.² *Loc. cit.*³ *A.R.*, 1913–14, p. 100.

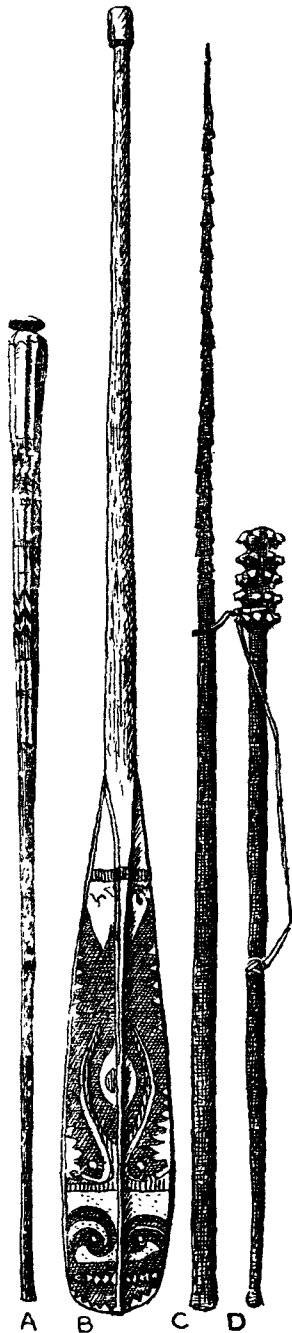


FIG. 5.—A, war club, Barimu = Kakimadase (L 467); B, paddle, Barimu (L 446): l. 2.06 m. (81 inches); C, spear, Gaima (L 771): l. 1.89 m. (74½ inches), barbed portion 73 cm.; D, war club, Gaima (L 775).

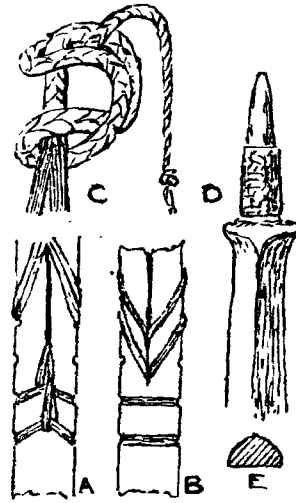


FIG. 6.—Details of bow and bowstring. A, B, method of finishing off bowstring; for the sake of clearness only two fibre strands are shown; C, loop-knot for stringing; D, end of (L 773); E, section of same.

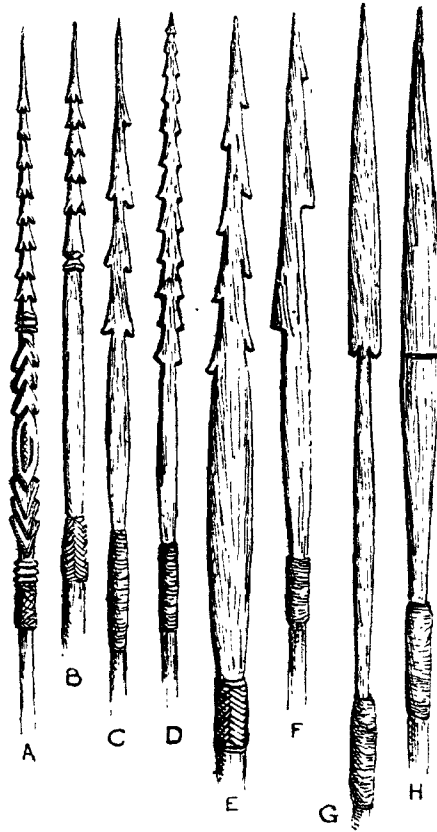


FIG. 7.—Carved wooden arrow-heads. A, B, E, Gaima; C, D, F, G, H, Koabu. A (L 755), l. 1.756 m.; B (L 753), l. 1.705 m.; C (L 566), l. 1.418 m.; D (L 565), l. 1.324 m.; E (L 754), l. 1.777 m.; F (L 564), l. 1.471 m.; G (L 558), l. 1.674 m.; H (L 762), l. 1.427 m.

The ends of each bamboo bowstring are split and notched on each side (Fig. 6). A strand of bark fibre is passed across the back of the bowstring from one notch to another of the first pair, and on the front side it is knotted, the free ends pass over the knot on the strand above it, pass through the slit in the bowstring, diverge outwards and upwards on the underside of the bowstring, each passing round the edge of the bowstring on to its front aspect, where they converge upwards to the centre of the bowstring. A fresh strand starts from the second pair of notches and pursues a similar course, and so on for each pair of notches. All the strands are eventually united to form a plait, which ultimately passes into a two-ply twisted string, which in No. 774 becomes gradually thinner and ends in a knot. The plait is formed into a loop-knot for stringing the bow (Fig. 6).¹

The twenty-five arrows in our collection may be grouped as follows:—A, bamboo heads; B, several barbed prongs; C, wooden heads. The arrows should be compared with the descriptions given in Vol. IV of the Torres Straits Reports. (This is referred to as "IV.")

A. With bamboo heads. The shaft may have the rind entire (766), or it may be scraped off except on the upper internode. There is a wooden aftershaft. At the junction of the two parts there may be a plaited cane collar, or, as in 761, a smooth gummed lashing of vegetable fibre; the bamboo is so cut that the point of the head is fashioned out of a node, thus making it thicker, stronger, and less liable to split. L 761, *Waduru-uere*, also labelled *Ipidarimo-uere* (i.e., arrow from Waduru or from Ipidarimo, on the opposite bank of the Fly River), Koabu, length 1·645 m.; the palm wood aftershaft has two rows of carved deep zig-zags; flattened bamboo head. L 766, *kowé*, Gaima, length 1·883 m.; aftershaft square in section with three rows of four blunt barbs and two square beads above; none of the barbs is opposite the other, except in a longitudinal direction; bamboo head concave. L 767, *kowé*, Gaima, length 1·665 m.

B. With more than one point. These *menakata* from Gaima agree in having the shaft scraped, except the upper internode, which in 770 has longitudinal scrapings; the palm wood prongs are kept apart by a plug and strengthened by ratan lashing (IV, Fig. 187, A). L 768, length 1·810 m., three prongs with 6–7 unilateral barbs; L 769, length 1·877 m., four prongs with three to five unilateral barbs; L 770, length 1·610 m., four prongs with three unilateral barbs.

C. With wooden heads. A selection of the more unusual types has been made in Fig. 7. In these all the shaft, except the upper 28–30 cm., has the rind scraped off and is blackened, but in the upper portion longitudinal and transverse scraped bands occur, sometimes the bands of whole skin are engraved with simple patterns. A, B, *ani-idi*, Gaima; head square in section, except lower part of B; each whorl has four barbs. E, *batere*, Gaima, flattened in section. These three have a collar of plaited cane and slender scraped shafts. C, D, F, *haru-haru*, Koabu, palm wood head, flattened in section. G, *hirima nepate* (also labelled Ipidarimo), Koabu. H,

¹ I collected a bow with this laced attachment at Aimaha, Kikori delta, and it occurs at Kumukumu, Aird Hill.

tere-uere, Koabu; the upper part of the head is plano-convex. These five have a thin vegetable lashing, dyed red.

The following from Koabu agree so well with arrows that I obtained in Mer, Torres Straits, that we may conclude that there was a regular trade in arrows from this district to the islands before the arrival of Europeans. L 559, 560, *boboku*, plain wooden head. L 561, *oto-oto*, palm wood head, unilateral barbs. L 563, *anidi*, three whorls of three barbs roughly made. L 567–571, *nalu-épuru* (IV, Figs. 181, 182); 568 is also labelled *oto-oto*. L 572, *Ibaiopu*, with a fusiform point. Most

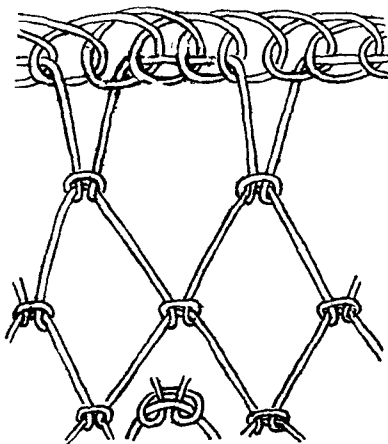


FIG. 8.—Detail of the fishing net, Gaima (L 400).

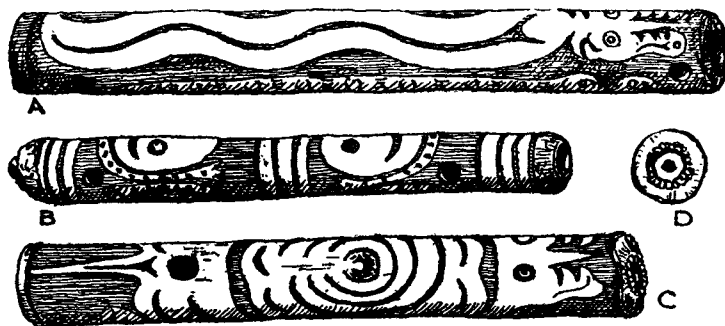


FIG. 9.

Tobacco pipes, Gaima: A (L 150), l. 46.5 cm., diam. 5.5 cm.; two holes; snake and an unrecognizable creature. B (L 149), l. 35 cm., diam. 5 cm.; two holes; four hind legs of frogs (?). C (L 148), l. 38.5 cm., diam. 6 cm.; one hole; labelled *segia*; fresh-water turtle. D, end of C, showing perforated disc of nacre and Abrus seeds.

have all the rind of the shaft scraped, except the upper internode, which may be decorated with a broad black band. The heads have sharp conical or fusiform points, and some have a zig-zag beading (IV, Fig. 182, A, B).

Hand fishing net, *nigisi*, Gaima. The net is fastened by a strip of bast in a continuous spiral to a circular ring of ratan, 61 cm. (24 inches) in diameter. The net, which has a depth of about 217 mm. (8½ inches), has a rim of continuous looping into which the loops of the outermost row of the body of the net are worked (Fig. 8). The string is two-ply.

I know of nine tobacco pipes. Landtman gave seven to our Museum and one to the British Museum, and there is one in the Port Moresby Museum, collected by A. P. Lyons at Iu. They all agree in consisting of one internode of bamboo and in having the background of the design scraped and coloured brown, so that the light design shows up clearly. Five of them (L 147, 149, 150, 151 and Pt. M.) have the septum intact at both ends, and in addition to the ordinary hole for the bowl there is a second one in a corresponding position near the other end; it is not possible to distinguish between these two, as they appear to have been used indiscriminately for the bowl. This is the first time that pipes with two lateral holes and blind ends have been recorded. I find, however, that in our Landtman collection there is one (164) from Tirio or Madiri (on the right bank of the Fly estuary and opposite to the Kabiri district), which is of similar type and technique of decoration, and though the design is not quite like any I have seen from Kabiri, there can be no doubt that it is an imported specimen. [There is also a fairly typical richly engraved Kiwai pipe (L 161) of two internodes and a terminal hole, but a second small hole has been made near the open end, possibly due to Kabiri influence.] L 147 has the centre of one end blackened and surrounded by two rows of *Abrus* seeds, while in L 148 the hole at the open end is pierced through a small disc of pearl shell, which is surrounded by a single circle of *Abrus* seeds, the black ends of which are centripetal (Fig. 9, c, d). Most of the designs on the pipes are representations of animals or parts of animals—among these I think I can recognize a frog (152), hind legs of a frog (149), fresh-water turtle (148), snake (150), crocodile (B.M.), two newly-hatched hornbills (Landtman's identification, 151), a bird or turtle, and a fish (B.M.).

A lime gourd, Gaima, with a pith stopper (Fig. 10), has on one side an engraved design of a central circle and a spiral line enclosing it, the outer whorl of the spiral with transverse carved lines; an attempt at the same design on the opposite side. One lime spatula (L 294) is a sharply pointed splint of cassowary bone, 24 cm. in length; the other (L 295) is similar in form, but made of the rind of the stalk of a palm leaf, length 23.5 cm. (L 147); another type is shown in Plate XIX, Fig. 3.

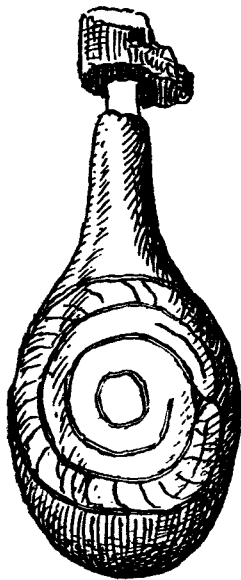


FIG. 10.
Lime gourd with pith
stopper, Gaima
(L 542): l. 23 cm.

In our Landtman collection there are two drums labelled "Kiwai," which, without any doubt, must have come from Kabiri (Fig. 11). Their great length and large high handles distinguish them from any other type of drum from New Guinea, and their decoration settles their origin. They are cylindrical, but are slightly and gradually constricted towards the centre. The tympanum is made of the skin of a *Tetrodont* fish with extremely small dermal spines, and is cemented on; the lashing of A is rough and appears to be put on for a temporary purpose. The plaited ratan band near the handle of A was put on to strengthen

the drum, as it was cracking; the neatly plaited ring in the handle doubtless served for suspension. The handle in both is carved in simple patterns. The main carving is at the open end. In A there is a double-headed fresh-water turtle (?) in low relief; between the fore and hind limbs is a circular design, in the centre of which is a small disc of pearl shell surrounded by Abrus seeds (this has entirely disappeared on one side). In B there is a bilobed design in the place corresponding to the hind limbs of the turtle on the former drum; the annular design is replaced by concentric crescents, the rest of the open end is occupied by simple patterns. The intaglio parts have been painted red and white.

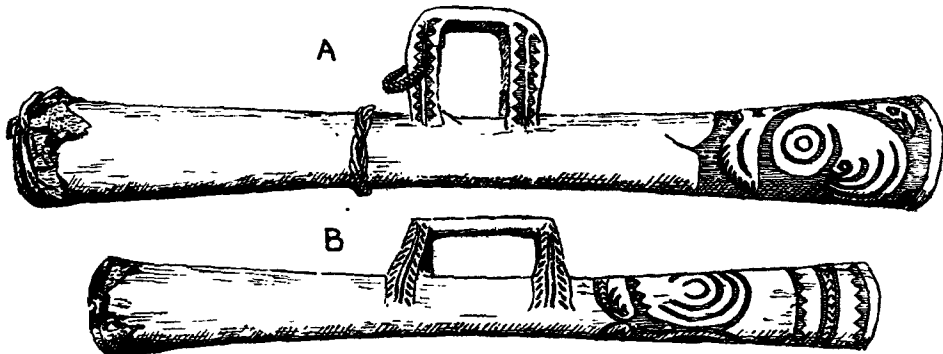


FIG. 11.

Drums : A (L 513), l. 127 cm., diam. 15 cm. at tympanum, 14 × 16 cm. at open end ; handle 21 cm. long, 14·5 cm. high. B (L 510), l. 108 cm., diam. about 13 cm. at each end ; handle 25 cm. long, 8·5 cm. high.



FIG. 12.

Drum, Isagu, Port Moresby Museum (from a photograph and sketch): l. 1·45 m. (57 inches), diam. at tympanum 20 cm. (8 inches).

In the Port Moresby Museum there is a drum obtained by A. P. Lyons at Isagu, which is of a different type (Fig. 12). It is cylindrical, with jaws at one end, and at the other is a tympanum made of kangaroo skin; the ratan bands which keep the skin in place have splints of bamboo inserted beneath them, which thus act as wedges. The drum is carved in the typical manner.

We have no information concerning the following objects, most of which are doubtless ceremonial.

Two human effigies are known to me: one is in private hands at Daru, Papua the other, which came from Pigi, was given to me by Mr. J. E. N. Westwood (Fig. 13). The body and limbs are cut out of a flat board, the head, hands, and feet being carved out of a soft, pith-like wood, and are removable. On the head is the conical cap; the eyes are of pearl shell, with a circle of Abrus seeds with the black ends centripetal; the nose is rather narrow and the lips thin but very

protuberant. There is a hole in the chest; the navel is a *Helix* shell surrounded by *Abrus* seeds; the wristlets and armlets are of twisted fibre. The painting of the body is indicated in the figure, as are the pigments employed, viz., white, black, yellow ochre, and a reddish chocolate.



FIG. 13.—Human effigy, Pigi: ht. 121 cm. (47½ inches), br. 43 cm. (17 inches).
Cambridge Museum.

At Daru I saw two small models of human heads, one painted red and black, the other white with a large black ring round the eyes; in both the eyes are of pearl shell surrounded by *Abrus* seeds (Plate XX, Fig. 6). The former was very similar to a specimen (Fig. 14) from Kubu, and described as “a head used for decorating a shield-shaped mask.” It is carved in the same soft wood as that of the effigy, and painted white, black, red and chocolate; the nose has a white tip, and there is a white disc in the centre of the forehead; the eyes are of black cement, with a central plug of wood, and encircled with *Abrus* seeds. Landtman also gave a very similar specimen to the British Museum, which is 18 cm. long, but it has a sagittal crest. In all these specimens the face is long and narrow, the nose is rather narrow, and the tongue is protruding.

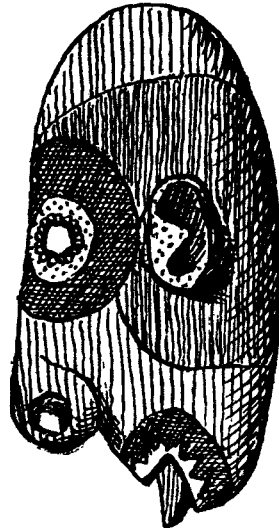


FIG. 14.
Model of human head, Kubu
(L 313): l. 23 cm. (9 inches).

Landtman gave to our Museum a long ovoid mask (*davi*) from Kubu, made out of one piece of very light, pith-like wood (Fig. 15). There is a narrow strip of ratan round the edge, which is sewn over with ratan. The back has two longitudinal ridges on each side, into the outer of which the plumes are inserted; a stick, passed right across them at about the lower third; at the junction of the ridges near the top, a stopper-like piece of wood is inserted; near the lower end is an orifice which opens out on the front side in the two eyeholes of the mask. The

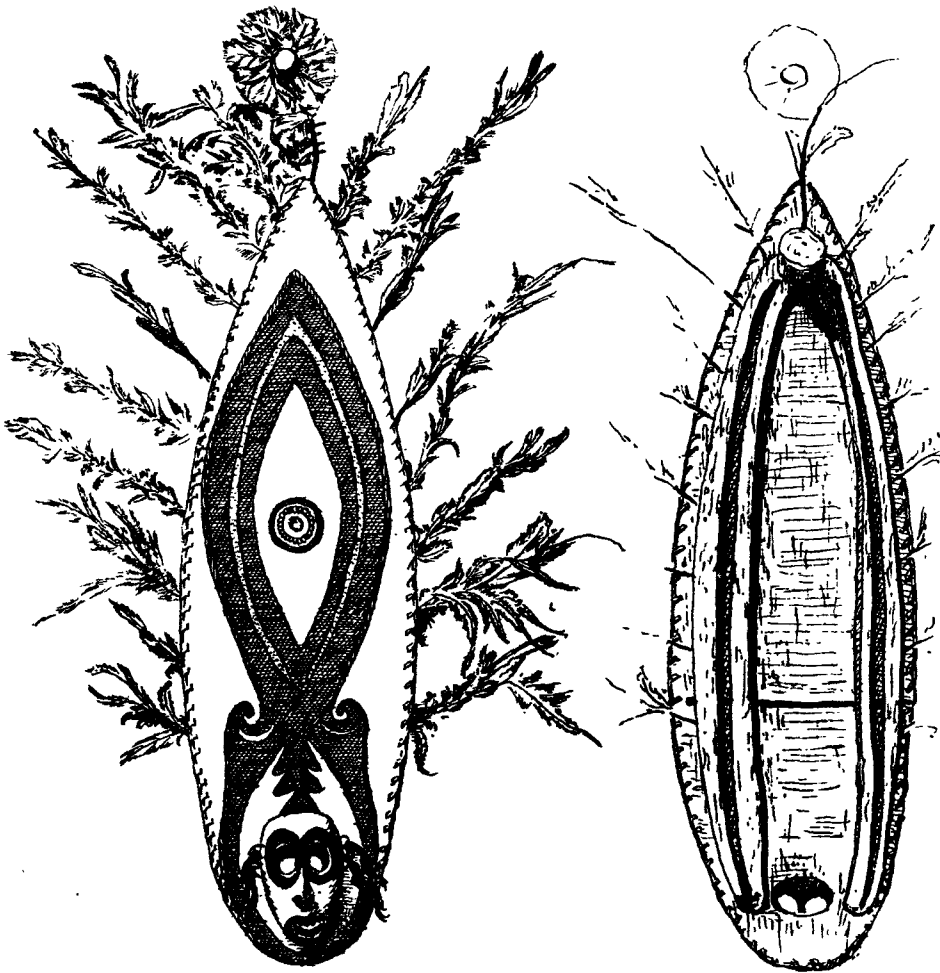


FIG. 15.

Mask, Kubu (L 312): l. 1 m., br. 28 cm.; front and back views.

front is painted white, with a design in black, yellow, and chocolate. Near the centre is a raised disc of cement bordered by *Abrus* seeds; doubtless originally it carried a disc of nacre. At the lower end is a human head, 16 cm. long, painted white with a black border round the eyes and mouth; the large orbits are perforated, the upper border and lobe of each ear has a tassel of red calico, the tongue protrudes slightly. The periphery is decorated with plumes of feathers of cockatoos and the hackle feathers of white cocks, etc. The centre one is ʹ-shaped,

the centre being a solid piece of pith; the stem is a strip of ratan neatly served with bark fibre where it is perforated for the quills of the feathers. These are white, and cut off square.

There was at Daru a painted truncated oval board bound round with ratan, with a typical head wearing a conical cap in high relief in the lower portion; above this is an oval design surrounded with white feathers, and above this again two concentric circles. Each of these two designs has in its centre a disc of nacre

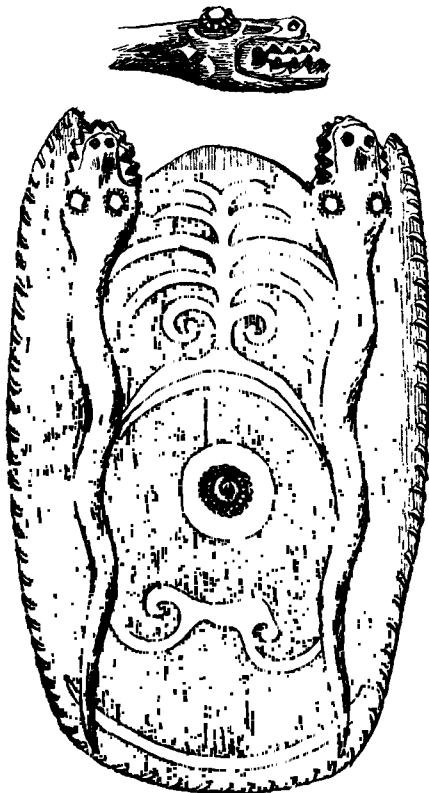


FIG. 16.—Ceremonial tablet with two snakes in high relief, Gaima : l. 50 cm. ($19\frac{1}{2}$ inches) ; br. 34.5 cm. ($13\frac{1}{2}$ inches). Cambridge Museum.

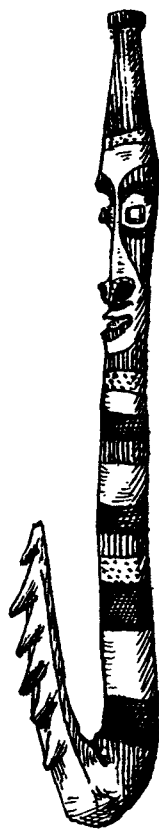
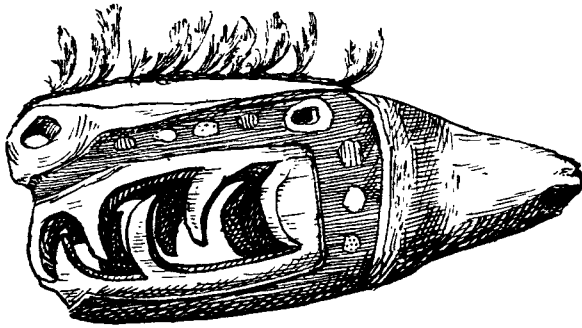
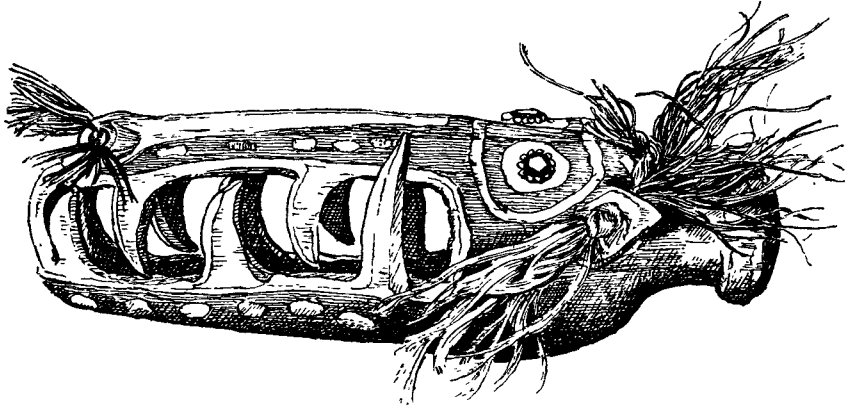


FIG. 17.—Ceremonial hook, Pigi ? : l. 43 cm., diam. 27 mm. Cambridge Museum.

encircled with *Abrus* seeds (Plate XX, Fig. 4). The Rev. E. Baxter Riley, of Daru, gave me a very old shield-shaped thin slab of wood from Gaima (Fig. 16), on which two snakes are carved in high relief. These are provided with teeth, pierced nostrils, and raised eyes of nacre and seeds; in the centre a *Helix* shell and rows of *Abrus* seeds are imbedded in a raised mass of cement; the background appears to have been black, the designs on the shield and snakes being dark red and chocolate. In the museum at Port Moresby there is an oval slab, 53.5 by 38 cm. (21 by 15 inches), collected by A. P. Lyons in 1914; it is labelled "*diwadi*, a dancing ornament worn on the head." There is the usual central disc of nacre and ring of seeds surrounded by three painted interrupted circles, the outermost

of which has angled projections; the whole is painted white, red, chocolate and yellow. Landtman gave to the British Museum a long ovoid painted board, 91 by 28 cm., from Kubu. The disc of nacre and ring of seeds is surmounted by a white, a yellow, and a red semicircle; near the lower end a mouth is painted, above which is a transverse row of coloured spots. The other designs are simple.



FIGS. 18, 19.

Models of crocodiles' heads: l. 36.5 and 20.4 cm. ($14\frac{1}{2}$ and 8 inches). Cambridge Museum.

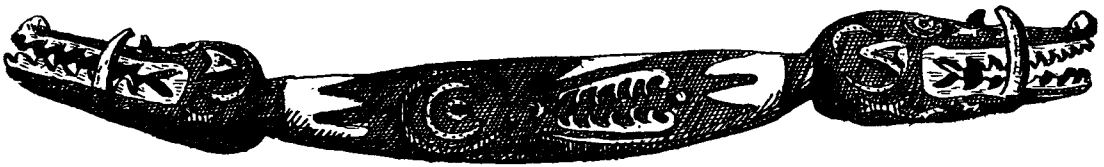


FIG. 20.

Dance ornament, Kubu (L 314): l. 103 cm. ($40\frac{1}{2}$ inches).

Mr. Westwood also gave me a barbed wooden hook and two carvings of crocodile heads. The hook (Fig. 17), which does not appear to serve any practical purpose, has its upper part carved as a human head, wearing a conical cap and having prominent nacre eyes, a pierced nose, and slightly prominent yellow tongue; the rest is painted in black, white, yellow and red bands. The crocodile heads (Figs. 18, 19) are carved out of a very soft light wood; the larger one has tufts of a vegetable fibre knotted through the nose and ears. Some of the fibres passing

through the ears are knotted on the top of the head to keep the tassels in place. The eyes are raised and are provided with Abrus seeds and probably originally with nacre. In the smaller one the eyes are painted, and a strip of ratan, to which small white feathers are lashed, passes along the top of the snout. Both are painted in the usual way, and the teeth are white.

A "dance ornament" from Kubu consists of a log of light wood with each end carved to represent the head of a crocodile, or possibly of a boar (Fig. 20), in which, as in Fig. 18, the underside of the jaws is entirely cut away. A noticeable feature is the pair of large tusks. The ground colour is black, the designs being left in the natural pale colour of the wood, or painted white, yellow, or chocolate; the eyes are painted.

I saw at Daru some small crocodile skulls in which the lower jaw was lashed to the upper; the eyes were discs of nacre with a ring of Abrus seeds, and the tip of the snout of one was adorned in a similar manner (Plate XX, Fig. 5).

THE AFFINITIES OF THE KABIRI.

Despite our imperfect information, I think the following deductions are warranted. Judging from photographs taken by Landtman, there are two well-marked physical types among the population: the one with a narrow face, thin lips, narrow nose, and apparently a bulbous forehead, the other with a broader face, thicker lips, and typical platyrrhine "Papuan" nose. The first type is that carved in the human effigies and heads, and we may therefore regard it as the racial type of the stock; the second type is that characteristic of many Western Papuans (Plate XIX, Figs. 1, 2). I have not yet been able to follow up the Kabiri type, it is not represented by Neuhauss in the *Völker-Atlas, Deutsch Neu-Guinea*, II.

The wearing of netted caps is common in New Guinea among the Kai of Hupe (in the interior, N. of Huon Gulf), and at the coast about 6° S. lat.¹ Conical caps, or "head-baskets," of various kinds are worn from south of 4° S. lat. to about 143° 30' E. long., and on the neighbouring islands²; and about 30 miles up the Sëpik river³; but O. Reche says that this head-gear is widely spread along the coast, but quickly disappears and is rare up the rivers.⁴

I am not yet in a position to discuss the distributional significance of the various shapes of drums in New Guinea, but the two main types met with here and in the whole Fly River district and in Torres Straits seem to indicate two cultural influences. I do not lay any stress on the single example of the type with jaws having a kangaroo-skin tympanum (Fig. 12), but the occurrence of mammal-skin tympana is of interest. Van der Sande⁵ gives various instances of tympana other than the ubiquitous lizard (*Varanus*) skin. Out of twenty-four drums described by

¹ Neuhauss II, Plates 198–201, 238, 239.

² O. Finsch, *Samoafahrten*, 1888, pp. 292, 299, 302, 306.

³ Neuhauss II, Plate 277.

⁴ *Kaiserin-Augusta-Fluss*, 1913, p. 84.

⁵ *Nova Guinea, III*, 1907, p. 305.

de Clercq and Schmeltz, eighteen have skin of *Varanus*, one of ray, one of cassowary, two of opossum from Misol and Salwatti, one of tree kangaroo from Mar (Wewe, the most northerly point of New Guinea), and one of deer obtained at Waigiu, but imported from Tidore; these all point to Indonesian influence. MacGregor says that the Bangu who live fifty or sixty miles up the Morehead river, "use the skin of the wallaby on the drum."¹ Seligmann and Strong state that "the tympana of their [of the Toro, thirty miles up the Bensbach river] drums consist of kangaroo skin, and the drums themselves were larger than those we had previously seen in this district. It should, however, be noted that far larger mammal-skin covered drums are said to be used some distance up the Bamu river."² This last statement can scarcely refer to the Kabiri district, as it had not then been visited, but doubtless these tympana are more widely distributed in the Bamu district. J. W. R. Koch refers to a drum from South New Guinea with a kangaroo-skin tympanum.³ When in Torres Straits in 1914, Mr. C. H. Walker gave me a drum of the well-known Tugeri type, with a kangaroo-skin tympanum; it was stated to come from the Bugi, whose home seems to have been mainly to the west of the mouth of the Mai Kasa. Landtman obtained several drums of the "Tugeri" type in a village a little inland of "Budji" (Bugi), but he was informed that they are not manufactured by the coast people, who obtain them from further inland. The same holds good for the beautifully decorated arrows which are also sometimes described as "Tugeri." This term seems to him to be somewhat uncertain, as it is used in rather a vague sense for the unknown tribes who in former times raided the British territory at the frontier.

The Kabiri drum (Fig. 12) is the only one, so far as I am aware, from British New Guinea with wedges. This method of tautening occurs on the south side of MacCluer Gulf, on Salwatti, and at Wewe (de Clercq and Schmeltz)⁴; but the skin is stretched in a more complicated manner, similar to that in Indonesia; Van der Sande records it from Mios Korwar, an island in Geelvink Bay,⁵ and O. Reche figures four specimens from various places on the Sëpik,⁶ one being 252 km. up the river; his fig. 450 is the only drum described by Reche with a tympanum of intestine, it came from Mandanam, 194 km. up the river; all the others have *Varanus* skin.

The decorative art has several distinctive features. The prevalence of spiral and curved lines seems to be characteristic of the great series of migrations from the interior which reached the sea at Merauke, the Fly estuary at this spot, and the Papuan Gulf further east. The interrupted circles are characteristic, as are also the discs of nacre surrounded by *Abrus* seeds. The use of variously coloured earths is also noticeable.

The ceremonial objects, like the decorative art, of the Kabiri are unlike any others previously recorded from New Guinea, and offer a marked contrast to those

¹ *Ann. Rep.*, 1895-96 (1897), p. 43.

² *Geog. Journ.*, xxvii, 1906, p. 229.

³ *De Zuidwest Nieuw-Guinea-Expeditie*, 1904-5, Leiden, 1908, p. 598.

⁴ Nos. 653, 655, 658, pp. 154, 155.

⁵ *Loc. cit.*, p. 306.

⁶ *Kaiserin-Augusta-Fluss*, 1913, Figs. 448, 450, 456, 458.

of the coastal tribes of the Fly estuary and of the rivers to the east. Neither is there any close resemblance in the material culture to that of the Sëpik (Kaiserin Augusta river), so far as our present evidence goes, though the resemblances in social and religious culture may prove somewhat closer.

In my paper on "Kava-drinking in New Guinea,"¹ I suggested that the Tugeri and the Kabiri have both come from the interior of New Guinea. O. Reche² draws attention to the remarkable similarities between the inhabitants of the Sëpik and the Tugeri, instancing mourning caps worn by women, tobacco cultivation, use of sago and betel, piercing of the *alæ nasi*, head hunting, spiral patterns, and even the physical type is strikingly similar according to Pösch.³

It is probable that the people of the middle region of the Fly, Murray Lake, and part of the Strickland river belong to the same culture group as the Kabiri; this area is characterized by stuffed human heads.⁴ Skulls with painted clay faces occur in abundance, not only on the Sëpik, but from the Fly to the Kikori in the Gulf. W. Foy⁵ first noted that cane masks of very similar type are found on the Sëpik and somewhat inland from the estuary of the Fly River; they also occur on Goaribari island.⁶ Farther east, especially among the Namau of the Purari delta and the Elema tribes of the Papuan Gulf, is another distinct culture which also appears to be in some way related to part of the culture of Central New Guinea.

I am greatly indebted to Dr. Gunnar Landtman, of Helsingfors, for his kind permission to reproduce his photographs, Plate XIX, Figs. 1—4, and Plate XX, Figs. 1—3. Figs. 4—6, on Plate XX, were photographed by my daughter, Kathleen Haddon, at Daru. I have also to thank Miss Estelle Canziani for the illustrations in the text.

APPENDIX.

SINCE the foregoing was in type I have heard from Lt.-Governor J. H. P. Murray of Port Moresby, who has recently visited the Aramia district, that the real name of the people is Gogodara—not Girara or Kabiri. They live in a large house called *ganama*, of which there is only one in a village; the women live in compartments under the same roof, but with a different entrance. They have a rough sort of lamp, *nakeo*, made generally of stone, but sometimes of wood, hollowed out in the centre to receive a resinous substance, *gagaba*, which burns steadily and gives a good light; but it burns rather fast. It has a pleasant smell and drives away mosquitoes. The *wiki* is also called *garabo*; it gives a good light and burns brightly and well; if you stick a piece in the trunk of a coconut palm you can see to climb up and select a nut by night. They have very fine gardens, which are manured with wallaby droppings. There is plenty of *gamada*.

DESCRIPTION OF PLATES.

PLATE XIX.

Fig. 1.—Man of the narrow-faced type with conical hat, Kubu.

" 2.—Bearded man of the broad-faced type with mourning netted cap and fringe depending from neck, Gaima.

" 3.—Man sitting and chewing betel, inside a house, Gaima.

" 4.—Woman wearing mourning netted cap, Gaima.

PLATE XX.

Fig. 1.—Entrance to the common hall for the men at the gable end of a house, Gaima.

" 2.—Entrance for women through the side of the roof of a house, the loop-holes evidently serve as windows for the women's apartments, Gaima.

" 3.—House with hand fishing nets hanging from the verandah, Gaima.

" 4.—Painted board with a wooden head and conical cap in high relief (Kubu?).

" 5.—Four small decorated crocodile skulls (Kubu?).

" 6.—Two carved wooden heads (Kubu?).

¹ *Man*, Oct., 1916, vol. xvi, 87, p. 145.

³ *Zeits. f. Ethnol.*, xxxix, 1907, p. 391.

⁵ *Globus*, lxxxii, 1902, p. 380, figs. 2, 4.

⁶ J. H. P. Murray, *Papua, or British New Guinea*, 1912, p. 189, Plates, pp. 187, 204.

² *Loc. cit.*, p. 480.

⁴ L. M. D'Albertis, *New Guinea*, II, 1881, fig., p. 134.



FIG. 1.



FIG. 2.



FIG. 3.

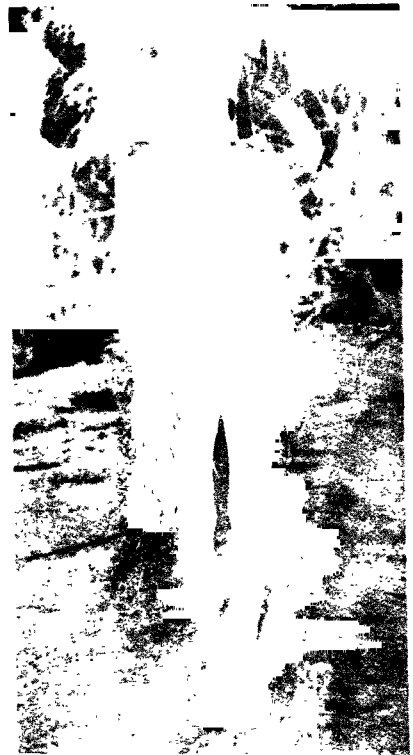


FIG. 4.

THE KABIRI OR GIRARA DISTRICT.



FIG. 1.



FIG. 2.



FIG. 3.

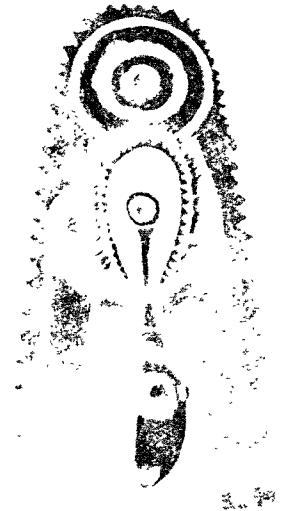


FIG. 4.

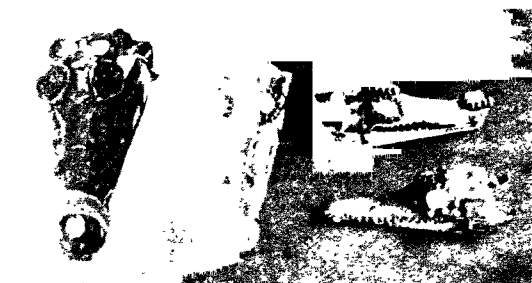


FIG. 5.



FIG. 6.

BALOMA ; THE SPIRITS OF THE DEAD IN THE TROBRIAND ISLANDS.¹

BY BRONISLAW MALINOWSKI, Ph.D. (Cracow), D.Sc. (London).

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I.

AMONG the natives of Kiriwina, death is the starting point of two series of events which run almost independently of each other. Death affects the deceased individual ; his soul (*baloma* or *balom*) leaves the body and goes to another world, there to lead a shadowy existence. His passing is also a matter of concern to the bereft community. Its members wail for him, mourn for him, and celebrate an endless series of feasts. These festivities consist, as a rule, in the distribution of uncooked food ; while less frequently they are actual feasts in which cooked food

¹ This article contains part of the results of ethnographical work in British New Guinea carried on in connection with the Robert Mond Travelling Studentship (University of London), and the Constance Hutchinson Scholarship of the London School of Economics (University of London), with assistance from the Commonwealth Department of External Affairs, Melbourne.

The writer spent some ten months, May, 1915—March, 1916, at Omarakana and the neighbouring villages of Kiriwina (Trobriand Islands), where he lived among the natives in a

is eaten on the spot. They centre around the dead man's body, and are closely connected with the duties of mourning, wailing and sorrowing for the dead individual. But—and this is the important point for the present description—these social activities and ceremonies have no connection with the spirit. They are not performed, either to send a message of love and regret to the *baloma* (spirit), or to deter him from returning ; they do not influence his welfare, nor do they affect his relation to the survivors.

It is possible, therefore, to discuss the native beliefs in after-life without touching the subject of mourning and mortuary ceremonies. The latter are extremely complex, and, in order to be properly described, a thorough knowledge of the native social system would be required.¹ In this article the beliefs concerning the spirits of the dead and after-life will be described.

A remarkable thing happens to the spirit immediately after its exodus from the body. Broadly speaking, it may be described as a kind of splitting up. In fact, there are two beliefs, which, being obviously incompatible, yet exist side by side. One of them is, that the *baloma* (which is the main form of the dead man's spirit) goes "to Tuma, a small island lying some ten miles to the north-west of the Trobriands."² This island is inhabited by living men as well, who dwell in one large village, also called Tuma ; and it is often visited by natives from the main island. The other belief affirms that the spirit leads a short and precarious existence after death near the village, and about the usual haunts of the dead man, such as his garden, or the sea-beach, or the waterhole. In this form, the spirit is called *kosi* (sometimes pronounced *kos*). The connection between the *kosi* and the *baloma* is not very clear, and the natives do not trouble to reconcile any inconsistencies with regard to this matter. The more intelligent informants are able to explain away the inconsistencies, but such "theological" attempts do not agree with each other, and there does not seem to be any predominantly orthodox version.³ The two beliefs,

tent. By October, 1915, he had acquired sufficient knowledge of the Kiriwinian language to be able to dispense with the services of an interpreter.

The writer desires to acknowledge the assistance he has received from Mr. Atlee Hunt, Secretary to the Commonwealth Department of External Affairs, and from Dr. C. G. Seligman, Professor of Ethnology in the University of London. The unfailing kindness and encouragement of Dr. Seligman have been of the greatest assistance throughout, and his work, *The Melanesians of British New Guinea*, provided a solid foundation on which to base the present investigations. Sir Baldwin Spencer, K.C.M.G., has been kind enough to read parts of the MS. and to give the writer his valuable advice on several important points.

¹ For an account of Kiriwina sociology, cf. Seligman's work, *The Melanesians of British New Guinea*, chaps. xlix–lii, pp. 660–707, and chap. lix for a description of the mortuary practices. Prof. Seligman gives also an outline of the native beliefs concerning an after-life (chap. lv), and his data, which were collected in a different locality of the district, will be quoted hereafter.

² Seligman, *op. cit.*, p. 733.

³ Cf. below, where the various versions are discussed. The nature of the *baloma* and *kosi*, and the material of which they are built, so to speak—whether shadow or reflection or body—will also be dealt with there. It may suffice here to say that the *baloma* are certainly considered to retain exactly the likeness of the living individual.

however, exist side by side in dogmatic strength ; they are known to be true, and they influence the actions of men and regulate their behaviour ; thus the people are genuinely, though not very deeply, frightened of the *kosi*, and some of the actions observed in mourning, and the disposal of the dead, imply belief in the spirit's journey to Tuma, with some of its details.

The dead man's body is adorned with all his valuable ornaments, and all the articles of native wealth he possessed are laid beside it. This is done in order that he may carry the "essence" or "spirit part" of his riches to the other world. These proceedings imply the belief in Topileta, the native Charon, who receives his "fare" from the spirit (see below).

The *kosi*, the ghost of the dead man, may be met on a road near the village, or be seen in his garden, or heard knocking at the houses of his friends and relatives, for a few days after death. People are distinctly afraid of meeting the *kosi*, and are always on the look out for him, but they are not in really deep terror of him. The *kosi* seems always to be in the mood of a frivolous, yet harmless, hobgoblin, playing small tricks, making himself a nuisance, and frightening people, as one man might frighten another in the darkness for a practical joke. He may throw small stones or gravel at anyone passing his haunt of an evening ; or call out his name or laughter may be heard coming out of the night. But he will never do any actual harm. Nobody has ever been hurt, still less killed, by a *kosi*. Nor do the *kosi* ever employ any of those ghastly, hair-raising methods of frightening people, so well known from our own ghost stories.

I remember well the first time I heard the *kosi* mentioned. It was a dark night, and I, in the company of three natives, was returning from a neighbouring village, where a man had died that afternoon and been buried in our presence. We were marching in Indian file, when suddenly one of the natives stopped, and they all began to talk, looking around with evident curiosity and interest, but without a trace of terror. My interpreter explained that the *kosi* was heard in the yam garden which we were just crossing. I was struck by the frivolous way in which the natives treated this gruesome incident, and tried to make out how far they were serious about the alleged appearance, and in what manner they reacted to it emotionally. There seemed to be not the slightest doubt about the reality of the occurrence, and I afterwards learned that although the *kosi* is quite commonly seen or heard, no one is afraid to go alone into the darkness of the garden where the *kosi* has just been heard, nor is anyone in the least under the influence of the heavy, oppressing, almost paralysing fear so well known to all those who have experienced or studied the fear of ghosts, as these are conceived by us in Europe. The natives have absolutely no "ghost stories" to relate about the *kosi* beyond insignificant pranks, and even little children do not seem to be afraid of him.

In general, there is a remarkable absence of superstitious fear of darkness, and no reluctance to go about alone at night. I have sent out boys, of certainly not more than ten years of age, a good distance alone at night, to fetch some object left on purpose, and I found that they were remarkably fearless, and for a small bit of

tobacco quite ready to go. Men and youths will walk alone at night from one village to another, often a couple of miles, without the chance of meeting anyone. In fact, as such excursions are usually carried out in connection with some love adventure, often illicit, the man would avoid meeting anybody by stepping aside into the bush. I remember having met well on the road in the dusk solitary women, though only old ones. The road from Omarakana (and a whole series of other villages lying not far from the eastern shore) to the beach passes through the *raiboag*, a well-wooded coral ridge, where the path winds through boulders and rocks, over crevasses and near caves, at night a very uncanny type of surrounding; but the natives often go there and back at night, quite alone; of course, individuals differ, some being more afraid than others, but in general there is very little of the universally reported native's dread of darkness among the Kiriwinians.¹

Nevertheless, when death occurs in a village, there is an enormous increase of superstitious fear. This fear is not, however, aroused by the *kosi*, but by much less "supernatural" beings, *i.e.*, by invisible sorceresses called *mulukuausi*. These are actual living women who may be known and talked with in ordinary life, but who are supposed to possess the power of making themselves invisible, or of despatching a "sending" from their bodies, or of travelling vast distances through the air. In this disembodied form they are extremely virulent, powerful, and also ubiquitous.² Anyone who chances to be exposed to them is sure to be attacked.

They are especially dangerous at sea, and whenever there is a storm, and a canoe is threatened, the *mulukuausi* are there looking out for prey. Nobody, therefore, would dream of going on any more distant voyage such as south to the D'Entrecasteaux group, or east to the Marshall Bennets, or still further, to Woodlark Island, without knowing the *kaiga'u*, a powerful magic, designed to ward off and bewilder the *mulukuausi*. Even when building a sea-going *vaga* (canoe) of the large type, called *masawa*, spells must be uttered to reduce the danger from these terrible women.

They are also dangerous on land, where they attack people and eat away

¹ I have been struck by the enormous difference in this respect obtaining between the Northern Massim and the Mailu, a tribe on the south coast of New Guinea, which I visited during a six months stay in Papua in 1914-15. The Mailu people are conspicuously afraid of darkness. When, towards the end of my stay, I visited Woodlark Island, the natives there, who belong to the same group as the Kiriwinians (a group called by Seligman the Northern Massim), differed so obviously in that respect from the Mailu that I was struck with this the first evening, which I spent in the village of Dikoias. Cf. "The Natives of Mailu: Preliminary Results of the Robert Mond Research Work in British New Guinea," *Trans. Roy. Soc. South Australia*, vol. xxxix, 1915.

² Cf. C. G. Seligman, *op. cit.*, chap. xlvii, where similar maleficent women from another district (Southern Massim) are described. I do not dwell here in detail on the beliefs about the *mulukuausi*, but I am under the impression that the natives are not quite sure whether it is a kind of "sending" or "double" that leaves the body of the witch or whether she goes out herself on her errand in an invisible form. Cf. also "The Natives of Mailu," p. 653, and footnote on p. 648.

tongues, eyes, and lungs (*lopoulo*, translated "lungs," also denotes the "insides" in general). But all these data really belong to the chapter about sorcery and evil magic, and have only been mentioned here, where the *mulukuausi* interest us, as especially connected with the dead. For they are possessed of truly ghoulish instincts. Whenever a man dies, they simply swarm and feed on his insides. They eat away his *lopoulo*, his tongue, his eyes, and, in fact, all his body, after which they become more than ever dangerous to the living. They assemble all round the house where the dead man lived and try to enter it. In the old days, when the corpse was exposed in the middle of the village in a half-covered grave, the *mulukuausi* used to congregate on the trees in and around the village.¹ When the body is carried into the grave to be buried, magic is used to ward off the *mulukuausi*.

The *mulukuausi* are intimately connected with the smell of carrion, and I have heard many natives affirm that at sea, when in danger, they were distinctly conscious of the smell of *burapuase* (carrion), which was a sign that the evil women were there.

The *mulukuausi* are objects of real terror. Thus the immediate neighbourhood of the grave is absolutely deserted when night approaches. I owe my first acquaintance with the *mulukuausi* to an actual experience. Quite at the beginning of my stay in Kiriwina, I had been watching the wailing round a freshly made grave. After sunset, all the mourners retired into the village, and when they tried to beckon me away, I insisted on remaining behind, thinking that there might be some ceremony which they wanted to perform in my absence. After I had maintained my vigil for some ten minutes, a few men returned with my interpreter, who had previously gone to the village. He explained the matter to me, and was very serious about the danger from the *mulukuausi*, though, knowing white men and their ways, he was not so much concerned for me.²

Even in and around the village where a death has occurred there is the greatest fear of the *mulukuausi*, and at night the natives refuse to go about the village or to enter the surrounding grove and gardens. I have often questioned natives as to the real danger of walking about alone at night soon after a man had died, and there was never the slightest doubt that the only beings to be dreaded were the *mulukuausi*.

II.

Having dealt with the *kosi*, the frivolous and meek ghost of the deceased who vanishes after a few days of irrelevant existence, and with the *mulukuausi*, the

¹ The preliminary burial, as well as burying in the middle of the village, has recently been suppressed by Government.

² It must be noted that the grave was in olden days situated right in the middle of the village, and that a close vigil was kept over it, having, among other motives, that of protecting the corpse from these female ghouls. Now that the grave is outside the village the vigil has had to be abandoned, and the *mulukuausi* can prey on the corpse as they like. There seems to be an association between the *mulukuausi* and the high trees on which they like to perch, so that the present site of burial, placed as it is right among the high trees of the grove (*weika*) surrounding each village, is specially odious to the natives.

ghoulis, dangerous women who feed on carrion and attack the living, we may pass to the main form of the spirit, the *baloma*. I call this the main form because the *baloma* leads a positive, well-defined existence in Tuma; because he returns from time to time to his village; because he has been visited and seen in Tuma by men awake and men asleep, and by those who were almost dead, yet returned to life again; because he plays a notable part in native magic, and even receives offerings and a kind of propitiation; finally, because he asserts his reality in the most radical manner by returning to the place of life, by reincarnation, and thus leads a continuous existence.

The *baloma* leaves the body immediately after death has occurred and goes to Tuma. The route taken and the mode of transit are essentially the same as those which a living person would take in order to go from his village to Tuma. Tuma is an island; one must therefore sail in a canoe. A *baloma* from a coastal village would embark and cross over to the island. A spirit from one of the inland villages would go to one of the coastal villages whence it is customary to embark for Tuma. Thus from Omarakana, a village situated almost in the centre of the northern part of Boiowa (the main island of the Trobriand group), the spirit would go to Kaibuola, a village on the north coast, from whence it is easy to sail to Tuma, especially during the south-east season, when the south-east trade wind would be dead fair, and carry the canoe over in a few hours. At Olivilevi, a large village on the east coast, which I visited during the *milamala* (the annual feast of the spirits), the *baloma* were supposed to be encamped on the beach, where they had arrived in their canoes, the latter being of a "spiritual" and "immaterial" quality, though perhaps such expressions imply more than the natives conceive. One thing is certain, that no ordinary man under ordinary circumstances would see such a canoe or anything belonging to a *baloma*.

As we have seen at the outset, when a *baloma* leaves the village and the people who wail for him, his connection with them is severed; for a time, at least, their wailings do not reach him or in any way influence his welfare. His own heart is sore, and he grieves for those left behind. On the beach at Tuma there is a stone called Modawosi, on which the spirit sits down and wails, looking back towards the shores of Kiriwina. Soon other *baloma* hear him. All his kinsmen and friends come towards him, squat down with him, and join in his lamentations. Their own departure is brought home to them, and they are sorry to think of their homes and of all those they left behind. Some of the *baloma* wail, some sing a monotonous chant, exactly as is done during the great mortuary vigil (*iarwali*) after a man's death. Then the *baloma* goes to a well, called Gilala,¹ and washes his eyes, which renders him invisible.² From here the spirit proceeds to Dukupuala, a spot

¹ This well is situated not far from the shore, in the *raiboag*, the elevated, stony, wooded coral ridge, which runs in a ring round almost all the smaller islands of the archipelago and the greater part of the large island Boiowa. All the stones and the well here mentioned are real and can be seen by mortals.

² This effect of the Gilala water was explained by one of my informants only; the others did not know the object of this ablution, though all affirmed its existence.

in the *raiboag* where there are two stones called *Dikumaio'i*. The *balom* knocks these two stones in turn. The first responds with a loud sound (*kakupuana*), but when the second is hit the earth trembles (*ioiu*). The *baloma* hear this sound, and they all congregate round the newcomer and welcome him to Tuma.¹

Somewhere during this ingress the spirit has to face *Topileta*, the headman of the villages of the dead. At what stage exactly *Topileta* meets the stranger my informants were unable to say, but it must be somewhere in the early part of his adventures in Tuma, because *Topileta* lives not far from the *Modawosi* stone, and acts as a kind of Cerberus or St. Peter in so far as he admits the spirit into the nether world, and is even supposed to be able to refuse admission. His decision does not, however, rest on moral considerations of any description: it is simply conditioned by his satisfaction with the payment made by the newcomer. After death the bereaved relatives adorn the corpse with all the native ornaments which the deceased had possessed. They also put on his body all his other *vaigu'a* (valuables),² in the first place his ceremonial axe-blades (*beku*). The spirit is supposed to carry these away with him to Tuma—in their “spiritual” aspect, of course. As the natives explain simply and exactly: “As the man’s *baloma* goes away and his body remains, so the *baloma* of the jewels and axe-blades go away to Tuma, though the objects remain.”³ The spirit carries these valuables in a small basket and makes an appropriate present to *Topileta*. This payment is said to be made for showing the proper way to Tuma. *Topileta* asks the newcomer the cause of his death. There are three classes—death as the result of evil magic, death by poison, and death in warfare. There are also three roads leading to Tuma, and *Topileta* indicates the proper road according to the form of death suffered. There is no special virtue attached to any of these roads, though my informants were unanimous in saying that death in war was a “good death,” that by poison not so good, while death by sorcery is the worst. These qualifications meant that a man would prefer to die one death rather than another; and though they did not imply any moral attribute attached to any of these forms, a certain glamour attached to death in war, and the dread of sorcery and sickness seem certainly to cause those preferences.

With death in warfare is classed one form of suicide, that in which a man climbs a tree and throws himself down (native name, *lo'u*). This is one of the two

¹ This is a contradiction of the statement that the *baloma* assemble round the new arrival and help him in wailing. See below, VIII, the remarks about such inherent inconsistencies.

² The natives strictly distinguish between the *vaigu'a* (valuable possessions) and *gugu'a* (the other less valuable ornaments and objects of use). The main objects classified as *vaigu'a* will be enumerated in this article later on.

³ In practice the corpse is most carefully stripped of all valuables just before burial, and I saw even small shell earrings being extracted from the ear lobes, articles which the natives would not hesitate to sell for half a stick of tobacco (three farthings). On one occasion, when a small boy had been buried in my presence, and a very small and poor belt of *kaloma* (shell discs) was left on the body by mistake, there was great consternation and a serious discussion whether the body ought to be unearthed.

forms of suicide extant in Kiriwina, and it is practised by both men and women. Suicide seems to be very common.¹ It is performed as an act of justice, not upon oneself, but upon some person of near kindred who has caused offence. As such it is one of the most important legal institutions among these natives. The underlying psychology is, however, not so simple, and this remarkable group of facts cannot be discussed here in detail.

Besides the *lo'u*, suicide is also accomplished by taking poison, for which purpose the fish poison (*tuva*) is used.² Such people, together with those murdered by the gall-bladder of the poisonous fish, *soka*, go the second road, that of poison.

People who have died by drowning go the same road as those killed in war, and drowning was said to be also a "good death."

Finally comes the group of all those who have been killed by evil sorcery. The natives admit that there may be illness from natural causes, and they distinguish it from bewitchment by evil magic. But, according to the prevalent view, only the latter can be fatal. Thus the third road to Tuma includes all the cases of "natural death," in our sense of the word, of death not due to an obvious accident. To the native mind such deaths are, as a rule, due to sorcery.³ The female spirits go the same three ways as the male. They are shown the way by Topileta's wife, called Bomiamuia. So much about the various classes of death.

A man or woman unable to pay the necessary fee to the gatekeeper of the Underworld would fare very badly. Such a spirit, turned out of Tuma, would be banished into the sea and changed into a *vaiaba*, a mythical fish possessing the head and tail of a shark and the body of a stingaree. However, the danger of being turned into a *vaiaba* does not appear to loom conspicuously in the native mind; on the contrary, on enquiry I gathered that such a disaster rarely, if ever,

¹ During my stay one young man committed suicide in the *lo'u* manner in a neighbouring village. Though I saw the corpse a few hours after death, and was present at the wailing and burial and all the mortuary ceremonies, it was only after a few months that I learned he had committed suicide, and I never could learn his motive. The Rev. E. S. Johns, the head of the Methodist Mission in the Trobriands, informs me that he used at times to register as many as two suicides a week (through poison) in Kavataria, a group of large villages situated in the immediate neighbourhood of the Mission station. Mr. Johns tells me that suicides occur in epidemics, and that they have been fostered by the discovery by the natives of the white man's power to counteract the poison. The aim of the suicide is to punish the survivors, or some of them.

² This poison is prepared from the roots of a cultivated vine; its action is not very rapid, and if emetics be properly administered in time life is usually saved.

³ There seems to be some possibility of death by old age, especially in the case of very insignificant old men and women. Several times, when I was asking of what a man had died, I received the answer, "He was very old and weak and he just died." But when I asked about M'tabalu, a very old and decrepit man, the chief of Kasana'i, whether he was going to die soon, I was told that, if no *silami* (evil spell) were thrown on him, there was no reason why he should not go on living. Again, it must be remembered that a *silami* is a private thing, not to be talked about except with intimate friends. It must be emphasized that the "ignorance of natural death" is the general typical attitude expressed in custom and reflected in such legal and moral institutions as exist, rather than some kind of absolute apodictic statement, excluding any contradictions or uncertainties.

happens, and my informants were unable to quote any instance. When asked whence they knew about such things, they gave the usual answer, "ancient talk" (*tokunabogu livala*). Thus there are no ordeals after death, no accounts of one's life to give to anyone, no tests to undergo, and in general no difficulties whatever on the road from this life to the other.

As to the nature of Topileta, Professor Seligman writes: "Topileta resembles a man in every way except that he has huge ears, which flap continually; he is, according to one account, of the Malasi clan, and seems to lead very much the ordinary life of a Trobriand islander." This information was collected on a neighbouring island, Kaileula (called by Professor Seligman, Kadawaga), but it entirely agrees with what I was told on Kiriwina about Topileta. Professor Seligman further writes: "He (Topileta) has certain magical powers, causing earthquakes at will, and when he becomes old, making medicine which restores youth to himself, his wife and children.

"Chiefs still retain their authority in Tuma, and Topileta, though himself the most important being in Tuma . . . is so obviously regarded as different from all dead chiefs that he cannot, in the ordinary sense, be said to rule over the dead; indeed, it was difficult to discover that Topileta exerted any authority in the other world."¹

In fact, Topileta is an intrinsic accessory of Tuma, but, beyond his initial meeting with all spirits, he does not in any way interfere with their doings. Chiefs do, indeed, retain their rank, though whether they exercise any authority was not clear to my informants.² Topileta is, moreover, the real owner or master of the spirit-land on Tuma and of the villages.³ There are three villages in the nether world—Tuma proper, Wabuaima, and Walisiga. Topileta is the *tolivalu* (master of village) of all three, but whether this is a mere title or whether he has anything to say in important matters was not known to any of my informants. It was also unknown whether the three villages had any connection with the three roads leading to the nether world.

Having passed Topileta, the spirit enters the village in which he will dwell

¹ Seligman, *op. cit.*, p. 733.

² The distinction between rank and authority is important in Kiriwinian sociology. The members of the Tabalu section of the Malasi clan have the highest rank. The head of this clan wields authority over the village of Omarakana and, in a way, over a great portion of the main island and some adjacent islands. Whether he will retain this authority after death in Tuma seemed doubtful to To'uluwa, the present chief of Omarakana. But there was not the slightest doubt that he and all the other Tabalu, as well as everyone else, would retain their respective rank and their membership in clan and subclan. To understand this, *cf.* the excellent account of the Trobriand social system, in Seligman, *op. cit.*, chaps. xlix–liii.

³ In order to understand this statement the reader must be acquainted with the social system of the Kiriwinians (*see* Seligman, *loc. cit.*). There is a very close connection between every village and a certain section of a clan. Usually, but not always, this section is descended from an ancestor, who came out of the ground in that locality. In any case, the head of this section is always said to be the master or owner of the land (*tolipuaipuaia*, from *tolu*, a prefix denoting mastership, ownership, and *puaipuaia*, ground, soil, land).

henceforth. He always finds some of his relatives, and these may stay with him till a house is found or built for him. The natives imagine this exactly as happens in this world when a man has to move to another village—a by no means rare event in the Trobriands. For a time the stranger is very sad, and weeps. There are, however, decided attempts on the part of the other *baloma*, especially those of the opposite sex, to make him comfortable in his new existence, and to induce him to form new ties and attachments and forget the old ones. My informants (who were all men) were unanimous in declaring that a man coming to Tuma is simply pestered by the advances of the fair, and, in this world, bashful, sex. At first the spirit wants to weep for those left behind; his relative *baloma* protect him, saying, "Wait, let him have a spell; let him cry." If he has been happily married, and has left a widow for whom he cares, he naturally wants to be left for a somewhat longer time to his grief. All in vain! It seems (this is again the male opinion only) that there are many more women in the other world than men, and that they are very impatient of any prolonged mourning. If they cannot succeed otherwise, they try magic, the all-powerful means of gaining another person's affection. The spirit women on Tuma are not less expert, and no more scrupulous, in using love charms than the living women in Kiriwina. The stranger's grief is very soon overcome, and he accepts the offering called *nabuoda'u*—a basket filled with *bu'a* (betel nut), *mo'i* (betel pepper), and scented herbs. This is offered to him with the words "*Kam paku*," and if accepted, the two belong to each other.¹ A man may wait for his widow to join him in Tuma, but my informants did not seem inclined to think that many would do this. The blame for this rests, however, entirely on the Tuma belles, who use such potent magic that not even the strongest fidelity can possibly resist it.

The spirit, in any case, settles down to a happy existence in Tuma, where he spends another lifetime,² until he dies again. But this new death is again not complete annihilation, as we shall see hereafter.

III.

Until this occurs the *baloma* is by no means entirely out of touch with the living world. He visits his native village from time to time, and he is visited by

¹ This wooing in Tuma, as described to me by my informants, corresponds to the manner in which people mate on certain occasions called *katuyausi*. The *katuyausi* are expeditions of amorous adventure, in which the unmarried girls of a village go *en bloc* to another village and there sleep with the youths of that village. Any single male who fancies one of the girl-guests gives her (through an intermediary) some small present (a comb, some shell discs or turtle-shell rings), which is handed over with the words "*kam paku*." If accepted, the two belong to each other for the night. Such expeditions, though well established and sanctioned by custom, are strongly resented by the young men of the village from which the *katuyausi* starts, and they end as a rule in a sound thrashing administered by the male to the female youth of the village.

² A "lifetime" is undoubtedly a much less definite period to the natives than it is to ourselves.

his surviving friends and relatives. Some of these latter possess the faculty of getting right into the shadowy world of spirits. Others are able to get glimpses only of the *baloma*, to hear them, to see them from a distance or in the dark—just sufficiently clearly to recognize them, and to be absolutely sure that they are *baloma*.

Tuma—the place of the living—is a village where the natives of Kiriwina go from time to time. In Tuma and the adjoining islands turtle shell and the large white cowrie shells (*Ovulum ovum*) are very plentiful; in fact, this small island is the main source of those important articles of decoration for the northern and eastern villages of Kiriwina.¹ Therefore Tuma is often visited by men from the main island.

All my informants from Omarakana and the neighbouring villages knew Tuma quite well. And there was hardly anybody who had not had some experience of the *baloma*. One man saw a shadow in the twilight receding at his approach; another heard a well-known voice, etc., etc. Bagido'u, an exceptionally intelligent man of the Tabalu subclan, the garden magician of Omarakana, and my best informant on all matters of ancient lore and tradition, has seen any number of spirits, and had not the slightest doubt that a man staying in Tuma for some length of time would have no difficulty in seeing any of his deceased friends. One day he (Bagido'u) was getting water out of a well in the *raiboag* (stony woodland) on Tuma, when a *baloma* hit him on the back, and, on turning round, Bagido'u just saw a shadow retreating into the bush, and heard a smacking sound, such as is usually made with the lips if a native wants to attract somebody's attention. Again, one night, Bagido'u was sleeping in Tuma on a bed. Suddenly he found himself lifted out of it and put on the ground.

A large party of men, with To'uluwa, the chief of Omarakana, went to Tuma. They landed not far from the Modawosi stone, when they saw a man standing there. They immediately identified him as Gi'iopeulo, a great warrior and a man of indomitable strength and courage, who had died recently in a village not more than five minutes distance from Omarakana. When they approached, he disappeared, but they heard distinctly "*Bu kuisusi bala*" ("You remain, I shall go")—the usual form of "Good-bye." Another of my informants was in Tuma drinking water in one of the large water grottoes, so typical of the *raiboag*. He heard a girl called Buava'u Lagim cry out to him, calling him by name, out of this waterhole.

I have heard of many more such incidents. It is worthy of note that in all these cases the *baloma* are distinct from the *kosi*—that is, the natives are sure that it is a *baloma*, and not a *kosi*, that is seen or heard, though their slightly frivolous behaviour (like the throwing of a respectable man out of his bed, or hitting him on the back) does not differ from that of the *kosi* in any essential respect. Again, the natives do not seem to regard any of those appearances or pranks of the *baloma*

¹ Another centre is the Island of Kaileula.

with any sort of "creepy" feeling; they do not seem to be afraid of them, as Europeans are of ghosts, any more than they are of the *kosi*.

Besides these intermittent glimpses of the spirit life, the living are brought into touch with the *baloma* in a much more intimate manner, through the mediation of those privileged people who visit in their own person the land of the dead. Professor Seligman writes: "There are individuals who say that they have visited Tuma and returned to the upper world."¹ Such people are by no means rare, and are of both sexes, though, of course, they differ vastly in renown. In Omarakana, the village where I was living, the most renowned person of this sort was a woman, Bwoilagesi, a daughter of the late chief Numakala, brother and predecessor of To'uluwa, the present ruler of Omarakana. She has visited, and apparently continues to visit, Tuma, where she sees and speaks with the *baloma*. She has also brought back a *baloma* song from Tuma, which is sung very often by the women of Omarakana.

There is also a man, Moniga'u, who goes to Tuma from time to time and brings news from the spirits. Although I knew both those people very well, I was not able to get from them any detailed information as to their wanderings in Tuma. They were both very uneasy on this subject, and returned my questions with half-hearted and obvious answers. I was strongly under the impression that they were unable to give any detailed statements, and that all they knew was told by them to everybody, and was thus public property. Such public property was the song above mentioned,² and also personal messages from various spirits to their families. Bwoilagesi—with whom I talked once on this subject in the presence of her son, Tukulubakiki, one of the most friendly, decent and intelligent natives I met—stated that she never remembers what she saw, though she remembers what was told to her. She does not walk or sail to Tuma; she falls asleep and just finds herself among the *baloma*. She and her son were quite positive that the song was given her by the *baloma*. But it was evident that the subject was painful to Tukulubakiki, especially when I pressed about details. I was unable to find any instance in which my lady informant derived actual economic benefit from her exploits in Tuma, though her prestige was immensely enhanced, in spite of the existence of sporadic, yet unmistakable, scepticism.

Thus I was told by two of my informants that all such claims about seeing the *baloma* are downright lies. One of them, Gomaia, a boy of Sinaketa (a village on the southern half of the island) told me that one of the most remarkable men who used to visit Tuma was one Mitakai'io, of Oburaku; but even he was a humbug. He used to boast that he could go to Tuma in order to eat. "I want to eat now; I shall go to Tuma; there is plenty of food there: ripe bananas, yams and taro, ready to eat; fish and pigs; there is plenty of areca nut and betel pepper, too; all the time I go to Tuma I eat." It may be easily imagined how strongly these pictures

¹ Seligman, *op. cit.*, p. 734.

² Similar songs have also been brought by other people from Tuma.

would appeal to the natives' fancy, how they would enhance the personal prestige of the boaster and arouse the envy of the more ambitious. Boasting about food is the most prevalent form of native vanity or ambition. A commoner might pay with his life if he had too much food or too good a garden, and especially if he displayed it too boastfully.

Gomaia apparently did not like Mitakai'io's boastings, and tried to get at the truth. He offered one pound. "I'll give you one pound if you take me to Tuma." But Mitakai'io was satisfied with much less. "Your father and mother cry for you all the time; they want to see you; give me two sticks of tobacco and I shall go, see them, give them the tobacco. Your father saw me; he told me, 'Bring the tobacco from Gomaia.'" But Mitakai'io was not in a hurry to take Gomaia to the other world. Gomaia gave him the two sticks, and these were smoked by the wizard himself. Gomaia found it out and was very indignant, and insisted on getting to Tuma, promising to give the pound as soon as he returned from there again. Mitakai'io gave him three kinds of leaves, which he ordered him to rub all over his body, and to swallow another small parcel. This was done, and Gomaia lay down and went to sleep—but he never reached Tuma. This made him sceptical, but, though Mitakai'io never got the promised pound, he retained his general prestige.

The same Mitaikai'io exposed another minor Tuma seer, by name Tomuaia Lakuabula. There was a chronic controversy between the two, Mitaikai'io often expressing a contemptuous opinion about Tomuaia. Finally the matter had to be settled by a test. Tomuaia promised to go to Tuma and to bring some token from there. As a matter of fact, he went to the bush and stole a bunch of betel nuts belonging to Mourada the *tokaraiwaga valu* (village headman) of Oburaku. He consumed plenty of the nuts himself, keeping one, however, for future use. In the evening he said to his wife, "Prepare my mat on the couch; I hear the *baloma* singing; I shall soon be with them; I must lie down." Then he began to sing in his house. All the men outside heard him and said to each other: "It is Tomuaia who sings alone and none else." They told him so the next day, but he said they could not have heard him, but many of the *baloma* were singing, and he had joined them.

When day was approaching, he put the one betel nut, kept for the purpose, into his mouth, and at daybreak he got up, went out of his house, and, taking the betel nut from his mouth, cried: "I have been to Tuma; I have brought a betel nut from there." All the people were highly impressed with the token, but Mourada and Mitaikai'io, who had watched him carefully on the previous day, knew that he had stolen the bunch of nuts, and they exposed him. From that time Tomuaia did not talk about Tuma. I have noted this story exactly as I heard it from Gomaia, and I am telling it in the same form. The natives in their narrative very often do not preserve the right perspective, however. It seems to me probable that my informant has condensed into his account different occurrences; but in this place it is the main fact of the natives' psychological attitude towards "spiritism" that is interesting; I mean the pronounced scepticism of some individuals on this

subject and the tenacity of belief among the majority. It is also obvious from these stories—and it was stated outright by my sceptical friends—that the chief element in all wanderings to Tuma is the material benefit derived from this by the seers.

A slightly different form of communication with spirits is that of the men who have short fits, in which they talk to the *baloma*. I am not able even approximately to define the psychological or pathological basis of such phenomena. Unfortunately, they were only brought to my notice towards the end of my stay—in fact, about a fortnight before my departure, and then only by accident. One morning I heard loud and, it seemed to me, quarrelsome vociferation from the other side of the village, and, being always on the alert for some sociological “document,” I inquired from the natives in my hut what it was. They replied that Gumguya’u—a respectable and quiet man—was talking to the *baloma*. I hurried to the spot, but, arriving too late, found the man exhausted on his bed, apparently asleep. The incident did not arouse any excitement, because, as they said, it was his habit to talk to the *baloma*. The conversation was carried on by Gumguya’u in a loud and high-pitched tone that sounded like an abusive monologue, and it was said to have reference to a big ceremonial boat race which had taken place two days before. Such a race is always held when a new canoe is built, and it is the duty of the chief, who organizes it, to arrange a big *sagali* (ceremonial distribution of food) in connection with the festivities. The *baloma* are in some impersonal and vague manner always interested in festivities, and they watch to ensure plenty of food. Any scarcity, caused either by slackness or the bad luck of the organizer, is resented by the *baloma*, who blame him for it, whether it be his fault or not. Thus, in this case, the *baloma* had approached Gumguya’u with the intention of expressing their strong disapproval of the meagre character of the *sagali* made the other day on the beach. The organizer of the feast, was, of course, To’uluwa, the chief of Omarakana.

Dreams also seem to play some part in the commerce between the *baloma* and the living. Perhaps the cases in which principally the *baloma* thus appear to the living occur immediately after death, when the spirit comes and tells the news to any near friend or relative who is not on the spot. Again, *baloma* often come to women in dreams to tell them that they will become enceinte. During the *milamala*, the annual feast, people are frequently visited by dead relatives in dreams. In the first of the cases mentioned (when spirits after death come to absent friends or relatives) there is some latitude and some “symbolizing,” such as has been assumed in the interpretation of dreams throughout all ages and civilizations. Thus a large party of Omarakana boys went away to work on a plantation in Milne Bay, on the extreme east end of the mainland of New Guinea. Among them was Kalogusa, a son of To’uluwa, the chief, and Gumigawa’ia, a commoner from Omarakana. One night Kalogusa dreamt that his mother, an old woman, one of the sixteen wives of To’uluwa, now living in Omarakana, came to him and told him that she had died. He was very sad, and apparently showed his

grief by wailing. (The story was told to me by one of the party.) All the others knew that "something must have happened in Omarakana." When they learned on their way home that the mother of Gumigawa'ia had died, they were not at all astonished, and found in this the explanation of Kalogusa's dream.

This seems to be the proper place to discuss the nature of the *baloma* and their relation to the *kosi*. Of what stuff are they made? Of the same or of different substance? Are they shades, or spirits, or are they conceived materially? It is possible to put all these questions to the natives, the most intelligent of whom will grasp them without difficulty and discuss them with the ethnographer, showing a considerable amount of insight and interest. But such discussions have proved to me unmistakably that in dealing with these and similar questions one leaves behind the domain of belief proper and approaches quite a different class of native ideas. Here the native speculates rather than positively believes, and his speculations are not a very serious matter to him, nor does he trouble at all as to whether they are orthodox or not. Only exceptionally intelligent natives will enter into such questions at all, and these express rather their private opinion than positive tenets. Even the exceptionally intelligent natives have nothing in their vocabulary or store of ideas that would correspond even approximately to our ideas of "substance" or "nature," though there is a word, *v'ula*, corresponding approximately to "cause," "origin."

You may ask: "What is the *baloma* like? Is its body like ours, or different? And in what manner is it different?" You may further point out to the native the problem of the body remaining and the disembodied *baloma* going away. To such questions the answer will be almost invariably that the *baloma* is like a reflection (*saribu*) in water (or mirror for the modern Kiriwinian), and that the *kosi* is like a shadow (*kaikuabula*). This distinction—the "reflection" character of the *baloma* and the shadowy nature of the *kosi*—is the usual, but by no means the exclusive, opinion. At times both are said to be like *saribu* or like *kaikuabula*. I was always under the impression that such answers were not so much a definition as a simile. By that I mean that the natives were not at all certain that a *baloma* is made of the same matter as a reflection; they knew, in fact, that a reflection is "nothing," that it is a *sasopa* (lie), that there is no *baloma* in it, but the *baloma* is just "something like a reflection" (*baloma makawala saribu*). When forced against a metaphysical wall by such questions, "How can a *baloma* call out, and eat, and make love if it is like a *saribu*? How can a *kosi* hammer against a house, or throw stones, or strike a man if it is like a shadow?" the more intelligent replied more or less to the effect: "Well, the *baloma* and the *kosi* are like the reflection and like the shadow, but they are also like men, and they behave all the same as men do." And it was difficult to argue with them.¹ The less intelligent or less patient

¹ To judge leniently such "inconsistencies" of native belief, it is sufficient to remember that we meet the same difficulties in our own ideas about ghosts and spirits. No one who believes in ghosts or spirits ever doubts that they can speak, and even act; they can rap on tables or with table legs, lift objects, etc.

informants were inclined to shrug their shoulders over such questions; others, again, would obviously become interested in the speculations, and produce extempore opinions, and ask your view, and just enter into a metaphysical discussion of a sort. Such extemporized opinions, however, never amounted to very far-reaching speculations; they just turned round the general views above mentioned.

It must be clearly understood that there were certain tenets which my informants one and all would endorse. There is not the slightest doubt that a *baloma* retains the semblance of the man he represents, so that if you see the *baloma*, you recognize the man that was. The *baloma* live the life of men; they get older; they eat, sleep, love, both whilst in Tuma and on visits which they pay to their villages. All these were points on which the natives had not the slightest doubts. It will be remarked that these tenets refer to actions of the *baloma*, describe their behaviour, and also that some of them—such as the belief in the *baloma's* need of food, for instance—imply certain behaviour on the part of men (compare below, description of the *milamala*). The only almost general tenet concerning the *baloma* and *kosi* was that the former are like reflections, the latter like shadows. It is noteworthy that this double simile corresponds respectively to the open, defined, permanent nature of the *baloma* and to the vague, precarious, nocturnal character of the *kosi*.

But even as to the fundamental relations between the *baloma* and *kosi* there exist essential discrepancies—discrepancies which bear not merely on their nature, but even upon their relative existence. By far the more general view is that the *baloma* goes straight to Tuma and that another spirit, the *kosi*, roams about for a short time. This view admits of two interpretations: either there are two spirits in the living man, and they both leave the body at death, or else the *kosi* is a kind of secondary spirit, appearing only at death and absent in a living body. The natives understood this question if I put it in this form: “Do the *baloma* and *kosi* stop in the body all the time? Or, on the contrary, does the *baloma* alone stop in the body and the *kosi* only appear at death?” But the answers were all vacillating and contradictory, the same man giving different answers at various times, the best proof that one was in the domain of pure extempore speculation.

Besides this more general view, I found several men who repeatedly maintained that the *kosi* is the first stage of a development, and that subsequently, after a few days, the *kosi* is transformed into a *baloma*. Here we would have, therefore, only one spirit, who lingers for a time after death round and near his home and then departs. In spite of its greater simplicity and logical plausibility, this belief was by far the less pronounced. It was, however, independent and developed enough to prevent the former belief being assumed as exclusive or even orthodox.

An interesting variation of the first version (that of a parallel existence of both *baloma* and *kosi*) was that given by Gomaia, one of my best informants. He was positive that only such men as had been sorcerers (*bwoga'u*) during their life would produce a *kosi* after death. To be a *bwoga'u* is not very difficult, however.

Any man who knows any of the *silami* (evil spells), and who is in the habit of practising them, is a *bwoga'u*. According to Gomaia, the others (the ordinary persons) would not become *kosi*; they would become *baloma* only, and go to Tuma. In all other particulars—such as the respective nature of *baloma* and *kosi*, and the behaviour as well as the precarious existence—Gomaia agreed with the general views. His version is noteworthy, because he is a very intelligent native and his father was a great wizard and *bwoga'u*, and his *kadala* (maternal uncle) is also a sorcerer. Moreover, this version agrees very well with the fact that the *bwoga'u* is always imagined as prowling at night, and, in fact, except for the *mulukuausi*, he presents the only serious terror of the night. Again, the *mulukuausi*, though not the *bwoga'u* (a still more virulent form of evil-minded human being, wise in sorcery), have, as we saw above, a “double” or “sending” called *kakuluwala*, which leaves their body and travels invisibly. This belief in a “double” or “sending” is parallel to another, which affirms that the *mulukuausi* travel bodily.

These remarks show that, generally speaking, the question as to the nature of the *baloma* and *kosi* and of their mutual relationship has not crystallized into any orthodox and definite doctrine.

The relation of the *baloma* to the body of the living man is still less clear to the natives. They are unable to give any definite answers to such questions as: “Does the *baloma* stop in any part of the body (head, belly, lungs)? Can it leave it during life? Is it the *baloma* that walks in dreams? Is it the *baloma* of some people that go to Tuma?” Though the two last-mentioned questions are usually answered by “yes,” it is a very unconvincing affirmation, and it is obvious that these speculations are not backed up by orthodox tradition. Intelligence, memory, wisdom they localize in the body, and know the seat of each of those faculties of the mind; but the *baloma* they are not able to locate, and, indeed, I rather think they imagine that it is a double that detaches itself from the body at death, and not a soul that dwells in the body during life. I am only sure, however, that their ideas are in an uncrystallized form, rather felt than formulated, rather referring to activities of the *baloma* than analytically discussing his nature and various conditions of existence.

Another point about which there appears to be no one definite, dogmatic answer is the actual abode of the spirits. Do they reside on the surface of earth, on the island of Tuma, or do they live underground or elsewhere? There are several opinions, and the respective supporters were quite definite in upholding their views. Thus from a number of informants, including Bagido'u, a very serious and reliable man, I received the answer that the *baloma* live on the island of Tuma, that their villages are somewhere there, exactly as the *baloma* camp somewhere in the neighbourhood of a village in Kiriwina on their annual return during the *mila-mala*. The above-mentioned three villages of the dead share the surface of the island with Tuma, the village of the living. The *baloma* are invisible, and so is everything that belongs to them, and that is the reason why their villages can be there without being in anybody's way.

Another view is that the *baloma* descend underground to a real "nether world," and live there in Tumaviaka (Great Tuma). This view was expressed in two different versions, one of which speaks of a kind of two-storeyed underworld. When the *baloma* dies at the close of his first spiritual existence he descends to the lower story, or stratum, from whence only he is able to return to the material world (*cf. infra*, VI, Reincarnation). The majority reject this theory, and say that there is only one tier of nether world, which agrees with Professor Seligman's statement: "The spirits of the dead do not stay in the upper world with the living, but descend into the other world below the earth."¹ Again, this view of an underground Tuma seems to harmonize better with the prevalent idea on Kiriwina that the first human beings emerged from holes in the ground. Professor Seligman even obtained the account that "the world was originally colonized from Tuma, men and women being sent to the upper world by Topileta, who himself stopped underground."² That I did not come across this statement is not astonishing in consideration of the great diversity of views on certain matters, the nature of Tuma and its relation to the world of the living being one of them. Seligman's statement corroborates the opinion that "underground Tuma" is the most orthodox version, though, as already stated, the whole question is not dogmatically settled in native belief.

IV.

Let us return to the intercourse between living men and the spirits. All that was said above on this subject refers to what takes place in dreams or visions or to what is effected by furtive, short glimpses of spirits, as seen by men while awake and in a normal state of mind. All this kind of intercourse may be described as private and accidental. It is not regulated by customary rules, though, of course, it is subject to a certain frame of mind, and it has to conform with a certain type of belief. It is not public: the whole community does not share in it collectively, and there is no ceremonial associated with it. But there are occasions on which the *baloma* visit the village or take part in certain public functions—occasions on which they are received by the community collectively, when they obtain certain attentions, strictly official and regulated by custom, when they act and play their rôle in magical activities.

Thus every year, after the garden crops have been harvested and there is a marked pause in the gardening, because the new gardens cannot be seriously tackled yet, the natives have a time of dancing, feasting, and general rejoicing called *milamala*. During the *milamala* the *baloma* are present in the village. They return in a body from Tuma to their own village, where preparations are made to receive them, where special platforms are erected to accommodate them, and where customary gifts are offered to them, and whence, after the full moon is over, they are ceremonially but unceremoniously driven away.

¹ *Op. cit.*, p. 733.

² *Op. cit.*, p. 679.

Again, the *baloma* play an important part in magic. Names of ancestral spirits are recited in the magical spells; in fact, these invocations are perhaps the most prominent and persistent feature of the magical spells. Moreover, in some magical performances offerings are made to the *baloma*. There are traces of the belief that the ancestral spirits have some share in fostering the ends of the given magical performances; indeed, those offerings to the *baloma* are the only ceremonial element (in the narrower sense) in magical performances I was able to detect.¹

I wish to add in this place that there is no association between the *baloma* of a dead man and the relics of his body, such as his skull, jaw-bone, arm and leg bones, and hair, which are carried about by the relatives and used as lime pot, necklace, and lime spatulæ respectively, a connection which exists among some other tribes of New Guinea.²

The facts connected with the *milamala* and with the magical rôle of spirits must now be considered in detail.

The annual feast, *milamala*, is a very complex social and magico-religious phenomenon. It may be called a "harvest festival," as it is held after the yam crops have been harvested and the food houses are full. But, remarkably enough, there is no direct, or even indirect, reference to field activities in the *milamala*. There is nothing in this feast, held after the old gardens have yielded their results and the new ones are waiting to be made, which would imply any retrospective consideration of the past year's gardening or a prospect of the future year's husbandry. The *milamala* is the dancing period. Dancing usually lasts through the moon of *milamala* only, but it may be extended for another moon, or even for two. Such an extension is called *usigula*. No dancing proper takes place at other times of the year. The *milamala* is opened by certain ceremonial performances connected with dancing and with the first beating of the drums. This annual period of feasting and dancing is, of course, also accompanied by a distinct heightening of sexual life. Again, there are certain ceremonial visits paid by one village community to another, and return visits associated with gifts and with such transactions as buying and selling of dances.

Before proceeding to the proper theme of the present section—the description of the part played by the *baloma* in the *milamala*—it seems necessary to give a picture of the general aspect of the festive period, otherwise the details about the *baloma* would perhaps appear out of focus.

The *milamala* comes in immediate succession to the harvesting activities, which themselves present a distinctly festive character, though they lack the fundamental element of enjoyment for the Kiriwinian. The native finds, however, an enormous amount of joy and amusement in bringing home the harvest. He loves his garden and takes a genuine pride in his crops. Before they are finally

¹ "Ceremonial in the narrower sense," as opposed to the mere uttering of the spell over a certain object.

² For instance, the Mailu on the south coast. See *Trans. Roy. Soc. South Australia*, vol. xxxix, p. 696.

stacked in the special storehouses, which are by far the most conspicuous and picturesque buildings in a village, he takes several opportunities of displaying them. Thus, when the tubers of *taitu* (a species of yam)—much the most important crop in that part of the world—are taken out of the ground, they are properly cleaned of all earth, the hair with which they are covered is shaved off with a shell, and the tubers are piled in large conical heaps. Special huts or shelters are constructed in the garden to protect the *taitu* from the sun, and under these shelters the tubers are displayed—a large conical heap in the middle, representing the choice of the yield, and round it several smaller heaps, in which inferior grades of *taitu* are stacked, as well as the tubers to be used for seed. Days and weeks are spent in cleaning the tubers and piling them artistically into heaps, so that the geometrical form may be perfect and none but the very best tubers be visible on the surface. The work is done by the owner and his wife, if he has one, but parties from the village walk about the garden, paying each other visits and admiring the yams. Comparisons and praises are the main theme of conversation.

The yams may remain thus for a couple of weeks in the garden, after which time they are carried into the village. These proceedings have a pronouncedly festive character, the carriers decorating themselves with leaves, scented herbs, facial paint, though not with the “full dress” of the dancing-time. When the *taitu* is brought into the village the party shout a litany, one man saying the words and the others responding in one strident scream. Usually they come in running to the villages; then the whole party busy themselves arranging the *taitu* into conical heaps exactly similar to those from which it has just been taken in the garden. These heaps are made in the large circular space which forms the centre of the village, each heap, or several heaps, being put up in front of the yam-house, where the tubers will be finally stored.

But before that happens the yams will have to spend another fortnight or so on the ground, and be counted and admired again. They are covered with palm-leaves as a protection against the sun. Finally, there is another festive day in the village, when all the heaps are put into the yam-houses. This is done in one day, though the bringing of the yams into the village covers several days. This description may give some idea of the considerable heightening of the *tempo* in village life at the time of the harvest, especially as the *taitu* is often brought in from other villages, and the harvest is a time when even distant communities pay each other visits.¹

When the food is finally in the storehouses there is a pause in native gardening, and this pause is filled by the *milamala*. The ceremony which inaugurates the whole festive period is at the same time a “consecration” of the drums. Previous to this no drums may be beaten publicly. After the inauguration the drums can be used, and the dancing begins. The ceremony consists, like the majority of

¹ In this short, purely descriptive account of harvesting, I have purposely avoided sociological technicalities. The complex system of mutual gardening duties is an extremely interesting feature of Kiriwinian social economics. It will be described in another place.

ceremonies in Kiriwina, of a distribution of food (*sagali*). The food is put in heaps, and in this particular ceremony it is cooked and the heaps placed on wooden dishes or in baskets. Then a man comes along, and in a loud voice calls out a name at each heap.¹ The wife or other female relative of the man named takes the food and carries it to his house, where it is eaten. Such a ceremony (called distribution of *sagali*) does not seem to us much of a feast, especially as the climax—as we understand the climax of a feast, *i.e.*, the eating—is never reached communally, but only in the family circle. But the festive element lies in the preparations, in the collection of the prepared food, in making it all a common property (for each has to contribute his share to the general stock, which is to be equally divided among all the participants), and finally in the public distribution. This distribution is the opening ceremony of the *milamala*; the men dress in the afternoon and perform the first dance.

Now life in the village changes distinctly. People do not go to the gardens any more, nor do they perform any other regular work, such as fishing or canoe-building. In the morning the village is alive with all the inmates who have not gone to work, and often with visitors from other villages. But the real festivities begin later in the day. When the hottest hours of the day are over, at about three to four o'clock in the afternoon, the men put on their head-dresses. These consist of a great number of white cockatoo feathers, stuck into the thick black hair, from which they protrude in all directions, like the quills of a porcupine, forming large white haloes around their heads. A certain accent of colour and finish is given to the whole by a plume of red feathers that overtops the white sphere. In contrast to the gorgeous variety of feather head-dresses found in many other districts of New Guinea, the Kiriwinians have only this one type of decoration, which is repeated invariably by all individuals and in all forms of dance. Nevertheless, in conjunction with the cassowary tufts tipped with red feathers, and inserted into belt and armllets, the general appearance of the dancer has a fantastic charm. In the regular rhythmic movement of the dance, the dress seems to blend with the dancer, the colours of the red-tipped black tufts toning well with the brown skin. The white head-dress and the brown figure seem to be transformed into a harmonious and fantastic whole, somewhat savage, but in no way grotesque, rhythmically moving against the background to a monotonous and melodious chant and the overbearing beat of the drums.

In some dances a painted dancing-shield is used, in others they hold in their hands streamers of pandanus leaves. These latter dances, always of much slower rhythm, are disfigured (to the European taste) by the custom of the men wearing women's grass petticoats. The majority of dances are circular, the drum-beaters and singers standing in the middle, while the dancers move round them in a ring.

Ceremonial dances in full ornamentation are never held at night. When the sun goes down, the men disperse and take off their feathers. The drums stop for a

¹ In this and other instances I do not dwell upon such sociological details as do not bear directly upon the subject of this article.

while—it is the time when the natives have their main repast of the day. When night has fallen the drums are sounded again, and the performers, now wearing no ornaments, step into the ring. Sometimes they sing a genuine dancing song, and sound a proper dancing beat, and then the people perform a regular dance. But usually, especially later in the night, the singing ceases, the dancing is given up, and only the continued beat of the drums rings through the night. The people, men, women and children, now join and walk round the central group of drum-beaters in twos and threes, women with small children in arms or at the breast, old men and women leading their grandchildren by the hand, all walking with an untiring perseverance one after the other, fascinated by the rhythmical beat of the drums, pursuing the aimless and endless round of the ring. From time to time the dancers intone a long drawn “Aa . . . a; Eee . . . e,” with a sharp accent at the end; simultaneously the drums cease to beat, and the indefatigable carousal seems for a moment to be freed from its spell, without, however, breaking up or ceasing to move. Soon, however, the drummers take up their interrupted music no doubt to the delight of the dancers, but to the despair of the ethnographer, who sees a lugubriously sleepless night before him! This *karibom*, as it is called, gives the small children the opportunity to play, hopping about and across the slowly moving chain of grown-ups; it allows the old people and the women actively to enjoy, at least, a kind of imitation of dancing; it is also the proper time for amorous advances among the young people.

The dancing and the *karibom* are repeated day after day and night after night. As the moon waxes, the festive character, the frequency and care with which ornamental dances are held, and their duration, increases; the dances begin earlier, the *karibom* lasts well-nigh throughout the night. The whole life in the village and between villages is modified and heightened. Large parties of young people of both sexes visit neighbouring villages. Presents of food are brought from far away, and on the road people may be met loaded with bananas, coconuts, bunches of areca nut, and of taro. Some important ceremonial visits are paid, in which a whole village calls on another officially, under the leadership of the chief. Such visits are sometimes connected with momentous transactions, such as the buying of dances, for these are always monopolies, and have to be bought at a considerable price. Such a transaction is a bit of native history, and will be spoken of for years and generations. I was fortunate enough to assist at one visit connected with such a transaction, which always consists of several visits, on each of which the visiting party (who are always the sellers) perform the dance officially, the onlookers learning the dance in this way, and some of them joining in the performance.

All big official visits are celebrated with considerable presents, which are always given to the guests by the hosts. The latter, in their turn, will visit their former guests and receive the return gifts.

Towards the end of the *milamala*, visits are received almost daily from quite distant villages. Such visits in olden days had a very compound character. They

were undoubtedly friendly, and were intended to be so, but there was always danger lurking behind the official friendliness. The visiting parties were always armed, and it was on such occasions that the whole array of "ceremonial" arms came into display. Indeed, even now the carrying of arms is not entirely suppressed, though at present they are nothing more than articles of decoration and display, owing to the white man's influence. All the large wooden sword-clubs, some of which are beautifully carved in heavy hardwood; the carved walking-sticks and short, ornamental spears, all so well known from the New Guinea collections in the museums, belong to this class of weapon. They serve equally the purposes of vanity and of business. Vanity, display of wealth, of valuable, finely ornamented objects, is one of the ruling passions of the Kiriwinian. To "swagger" with a large wooden sword, murderous looking, yet nicely carved and painted white and red, is an essential element of the fun to a Kiriwinian youth in festive paint, with a white nose sticking out of a completely blackened face, or one "black eye," or some rather complex curves running all across his face. In olden days he was often called upon to use such weapons, and even now may resort to them in the white heat of passion. Either he fancies a girl, or he is fancied by one, and his advances, unless very skilfully conducted, are sure to be resented. Women and the suspicion of magical practices are the main causes of quarrels and village brawls, which, in accordance with the general quickening of tribal life at the *milamala*, were, and are, very much in season at these times.

Towards the time of full moon, when enthusiasm begins to reach its high-water mark, the villages are decorated with as large a display of food as possible. The *taitu* is not taken out of the yam-houses, though it is visible there, through the large interstices of the beams, forming the wells of the store-houses. Bananas, taro, coconuts, etc., are laid out in a manner which will be described in detail hereafter. There is also a display of *vaigu'a*, the native articles of value.

The *milamala* ends on the night of the full moon. The drums do not cease to be used immediately afterwards, but all dancing proper is absolutely stopped, except when the *milamala* is prolonged into a special period of extra dancing, called *usigola*. Usually the monotonous and insipid *karibom* is performed night after night, for months after the *milamala*.

I have been through the *milamala* season twice: once in Olivilevi, the "capital" village of Luba, a district in the southern part of the island, where the *milamala* takes place a month sooner than in Kiriwina proper. Here I saw only the last five days of the *milamala*, but in Omarakana, the main village of Kiriwina, I watched the whole proceedings from beginning to end. There I saw, among other features, one big visit, when To'uluwa went with all the men from Omarakana to the village of Liluta, in connection with the purchase of the Rogaiewo dance by the latter community from the former.

Let us now pass to that aspect of the *milamala* which really bears upon the subject treated in this article, namely, to the part played in the festivities by the *baloma*, who at this time pay their regular yearly visit to their native villages.

The *baloma* know when the feast approaches, because it is held always at the same time of the year, in the first half of the moon, which is also called *milamala*. This moon is determined—as their calendar in general—by the position of the stars. And in Kiriwina proper, the full moon of *milamala* falls in the second half of August or first half of September.¹

When the time approaches, the *baloma*, taking advantage of any spell of fair wind that may occur, sail from Tuma to their native villages. It is not quite clear to the natives where the *baloma* live during the *milamala*. They probably stay in the houses of their *veiola*, that is their maternal relatives. Possibly they, or some of them, camp on the beach near their canoes, if the beach is not too far, exactly as a party of near kinsmen from another village or from another island would do.

At any rate, preparations for them are made in the village. Thus, in villages belonging to chiefs, special rather high, though small, platforms, called *tokaikaya*, are erected for the *baloma* of the *guya'u* (chiefs). The chief is always supposed to be in a physically higher position than the commoners. Why the platforms for the spirit *guya'u* are so very high (they measure some 5 to 7 metres in height) I could not ascertain.² Besides these platforms several other arrangements are made in connection with the display of valuables and of food, with the professed intention of pleasing the *baloma*.³

The display of valuables is called *ioiova*. The headman of each village, or the headmen, as there are at times more than one, have usually a small covered

¹ The calendar arrangements in the Trobriand Islands are complicated by the fact that there are four districts, each of which places the beginning of the year, *i.e.*, the end of the *milamala* moon—at a different time. Thus in Kitava, an island to the east of the main island of the group, the *milamala* is celebrated some time in June or July. Then follow in July and August the southern and western districts of Bwoiowa, the main island, and some islands to the west (Kaileula and others). After which the *milamala* takes place in August or September in the central and eastern districts of the main island, in what is called by the natives Kiriwina, and last there follows Vakuta, the island to the south of Bwoiowa, where the *milamala* takes place in September or October. Thus the feast, and with it the whole calendar, is shifted over the space of four moons in one district. It seems that the dates of the garden activities also vary, keeping time with the calendar. This was stated by the natives with emphasis, but I found during the year I was in Bwoiowa that the gardens were more advanced in Kiriwina than in the western district, though the latter is one moon in advance of the former.

The dates of the moons are fixed by the position of the stars, in which astronomical art the natives of Wawela, a village lying on the beach in the southern half of the main island, excel. The Rev. M. K. Gilmour told me that the appearance of the *paloto*, the marine annelid *Eunice viridis*, which takes place on the reef near Vakuta, is a very important factor in regulating the native calendar, in fact, that in doubtful cases it decides the question. This worm appears on certain days towards the full moon, falling early in November or late in October, and this is the *milamala* time of Vakuta. In Kiriwina the natives told me, however, that they thoroughly rely on the astronomical knowledge of the Wawela men.

² No *tokaikaya* were made in Omarakana or Olivilevi during the *milamala* I saw in those villages. The custom is on the decline, and the erection of a *tokaikaya* necessitates a considerable amount of labour and trouble. I saw one in the village of Gumilababa, where there lives a chief of the highest rank (Mitakata, a *guya'u* of the *tabatu* rank).

³ How far, besides and behind this professed aim, vanity and the æsthetic motive are at work in prompting such displays, cannot be discussed here.

platform in the neighbourhood of their houses. This is called *buneiova*, and here the man's valuables, such articles of wealth as fall under the native name of *vaigu'a*, are displayed. Large polished axe blades, strings of red shell discs, large arm shells made of the conus shell, circular pigs' teeth or their imitation, these, and these only, form the proper *vaigu'a*. They are all placed on the platform, the strings of *kaboma* (red shell discs) being hung under the roof of the *buneiova*, so as to be readily accessible to view. When there are no *buneiova*, I saw temporary roofed platforms erected in the village, on which the valuables were displayed. This display takes place during the last three days of the full moon, the articles being put up in the morning and removed at night. The proper thing, when visiting a village during the *ioiova*, is to look at the things, even handle them, ask their names (every individual piece of *vaigu'a* has a proper name), and, of course, express great admiration.

Besides the exhibition of valuables, there is a great display of food, and this gives a much more "showy" and festive aspect to the villages. For this, long scaffoldings of wood, called *lalogua*, are erected, consisting of vertical stakes, about 2 to 3 metres high, planted in the ground, with one or two rows of horizontals running along the verticals. To the horizontals are attached bunches of bananas, taro, yams of exceptional size, and coconuts. Such structures run round the central place (*baku*), which is the dancing ground and centre of all ceremonial and festive life in every village. The year I was in Bwoiowa was an exceptionally poor one, and the *lalogua* did not reach more than 30 to 60 metres, encircling only one-third or less of a *baku*. I was told by several informants, however, that in a good year they might extend not only all round the central place, but also round the circular street which runs concentrically with the *baku*, and even outside the village into the "high road," that is the path leading to another village. The *lalogua* are supposed to please the *baloma*, who get angry whenever there is little display of food.

All this is merely a show which must afford the *baloma* a purely æsthetic pleasure. But they receive also more substantial tokens of affection, in the form of direct offerings of food. The first repast which is given to them takes place at the *katukuala*, the opening feast of the *milamala*, with which the festive period really begins. The *katukuala* consists of a distribution of cooked food, which takes place on the *baku*, and for which the food is supplied by all the members of the village, and redistributed among them.¹ This food is exposed to the spirits by being

¹ This is one of the innumerable food distributions (generic name *sagali*) which are connected with almost every feature of social life in the Trobriands. It is usually one clan (or two clans) that arranges the *sagali*, and other clans receive the food. Thus in the *katukuala* the Malasi clan first distribute the food and the *lukulabuta*, the *lukuasiga* and the *lukuba* receive it. After a few days another *katukuala* is held, with the inverse social grouping. The dual arrangement of the clans varies according to the district. In Omarakana the Malasi are so preponderant that they form one moiety for themselves, the three remaining clans forming the other. It is impossible to enter here into the detailed examination of the social mechanism and of the other features of the *sagali*.

placed on the *baku*. They partake of the "spirit substance" of the food exactly in the same way as they take away to Tuma the *baloma* of the valuables with which men are adorned at death. From the moment of the *katukuala* (which is connected with the inauguration of the dancing) the festive period begins for the *baloma* as well. Their platform is, or ought to be, placed on the *baku*, and they are stated to admire the dance and to enjoy it, though, in fact, mighty little notice is taken of their presence.

Food is cooked early every day, and exposed in big, fine wooden dishes (*kaboma*) in each man's house, for the *baloma*. After an hour or so the food is taken away and is presented to some friend or relative, who in turn will present the donor with an equivalent dish. The chiefs have the privilege of giving to the *tokay* (commoners) betel nut and pig, and of receiving in return fish and fruits.¹ Such food, offered to the *baloma*, and subsequently given away to a friend, is called *bubualu'a*. It is usually put on the bedstead in the house, and the man, laying down the *kaboma*, says: "*Balom' kam bubualua*." It is a universal feature of all offerings and gifts in Kiriwina that they are accompanied by an oral declaration.

Silakutuva is the name for a dish of scraped coconut exposed to the *baloma* (with the words "*Balom' kam silakutuva*"), and then presented also to some man.

It is characteristic that this *baloma* food is never eaten by the man who offers it, but always presented after the *baloma* has finished with it.

Finally, in the afternoon before the departure of the *baloma*, some food is prepared, and some coconuts, bananas, taro, and yams are put handy, and the *vaigu'a* (valuables) are placed in a basket. When the man hears the characteristic beat of the drums, which constitutes the *ioba*, or chasing away of the spirits, he may put these things outside, the idea being that the spirit might take away their *baloma* as a parting present (*taloi*). This custom is called *katubukoni*. The putting of these things in front of the house (*okaukueda*) is not quite essential, because the *baloma* can take them out of the house equally well. This was the explanation given to me when I was looking for the *baloma* gifts in front of the houses, and saw only in one place (in front of the chief's house) a few stone tomahawks.

As said above, the presence of the *baloma* in the village is not a matter of great importance in the mind of the native, if compared with such all-absorbing and fascinating things as dancing and feasting and sexual licence, which go on with great intensity during the *milamala*. But their existence is not altogether ignored, nor is their rôle by any means purely passive—consisting in the mere admiring of what goes on, or in the satisfaction of eating the food they receive. The *baloma* show their presence in many ways. Thus, while they are in the village, it is remarkable how many coconuts will fall down, not by themselves, but plucked by the *baloma*. Whilst the *milamala* was on in Omarakana, two enormous bunches of

¹ Of course, the chiefs have as much pig as they require before giving any to the *tokay*. But it is characteristic that the privileges of the chief have much more to do with the liberty to give than with the liberty to consume. Vanity is a stronger passion than greed—though perhaps this reflection does not express the whole truth of the matter!

coconuts fell down quite close to my tent. And it is a very pleasant feature of this spirit activity that such nuts are considered public property, so that even I enjoyed a coconut drink, free of charge, thanks to the *baloma*.

Even the small unripe coconuts that fall down prematurely do it much more often during the *milamala*. And this is one form in which the *baloma* show their displeasure, which is invariably caused by scarcity of food. The *baloma* get hungry (*kasi molu*, their hunger), and they show it. Thunder, rain, bad weather during the *milamala*, interfering with the dancing and feasting, is another and more effective form in which the spirits show their temper. As a matter of fact, during my stay, the full moon, both in August and September, fell on wet, rainy and stormy days. And my informants were able to demonstrate to me by actual experience the connection between scarcity of food and a bad *milamala*, on the one hand, and the anger of the spirits and bad weather on the other. The spirits may even go further and cause drought, and thus spoil the next year's crops. This is the reason why very often several bad years follow each other, because a bad year and poor crops make it impossible for the men to arrange a good *milamala*, which again angers the *baloma*, who spoil next year's crops, and so on in a *circulus vitiosus*.

Again, at times, the *baloma* appear to men in dreams during the *milamala*. Very often people's relatives, especially such as are recently deceased, come in a dream. They usually ask for food, and their wish is satisfied by gifts of *bubualu'a* or *silakutuva*. At times they have some message to impart. In the village of Olivilevi, the main village of Luba, the district south of Kiriwina, the *milamala* (at which I was present) was very poor, there being hardly any food-display at all. The chief, Vanoi Kiriwina, had a dream. He went to the beach (about half an hour from the village), and saw a big canoe with spirits, sailing towards the beach from Tuma. They were angry, and spoke to him: "What are you doing at Olivilevi? Why don't you give us food to eat, and coconut water to drink? We send this constant rain for we are angry. To-morrow, prepare much food; we will eat it and there will be fine weather; then you will dance." This dream was quite true. Next day anybody could see a handful of white sand on the threshold (*okaukueda*), of Vanoi's *lisiga* (chief's house). How this sand was connected with the dream, whether it had been brought there by the spirits or by Vanoi in his dream-existence and dream-walk, none of these details was clear to my informants, among whom was Vanoi himself. But it was certain that the sand was a proof of the anger of the *baloma* and the reality of the dream. Unfortunately, the prophecy of fine weather failed entirely, and there was no dancing that day, as the rain was pouring. Perhaps the spirits were not quite satisfied with the amount of food offered that morning!

But the *baloma* are not entirely materialistic. They not only resent scarcity of food and poor offerings, but they also keep strict watch over the maintenance of custom, and they punish with their displeasure any infraction of the traditional customary rules which ought to be observed during the *milamala*. Thus I was told that the spirits strongly disapproved of the general laxity and slowness with

which the *milamala* was at present observed. Formerly, nobody would work in the fields or do any other kind of labour during the festive period. Everybody had to be bound on pleasure, dancing and sexual licence, in order to please the *baloma*. Nowadays, people will go to their gardens and potter about, or go on preparing wood for house building or canoe making, and the spirits do not like it. Therefore their anger, which results in rain and storm, spoils the *milamala*. This was the case at Olivilevi, and later on at Omarakana. At Omarakana there was still another cause for their anger, connected with the ethnographer's presence in that place, and I had to hear several times reproachful allusions and remarks from the elders and from To'uluwa, the chief, himself. The fact was that I had bought from various villages some twenty dancing shields (*kaidebu*); I wanted to see what the *kaidebu* dances were like. Now, in Omarakana there was only one dance in progress, the *rogaiewo*, a dance performed with *bisila* (pandanus streamers). I distributed the *kaidebu* among the *jeunesse dorée* of Omarakana, and the charm of novelty being too strong (they had not had sufficient *kaidebu* to dance with properly for the last five years at least), they at once began to dance the *gumagabu*, a dance performed with the dancing shields. This was a serious breach of the customary rules (though I did not know it at the time), for every new form of dance has to be ceremonially inaugurated.¹ The omission was very much resented by the *baloma*, hence bad weather, falling coconuts, etc. This was brought up against me several times.

After the *baloma* have enjoyed their reception for two or four weeks (the *milamala* has a fixed end, the second day after the full moon, but it may begin any time between the previous full moon and the new moon), they have to leave their native village and return to Tuma.² This return is compulsory, and is induced by the *ioba*, or ceremonial hunting away of the spirits. The second night after the full moon, about one hour before sunrise, when the leatherhead (*saka'u*) sings out, and the morning star (*kubuana*) appears in the heavens, the dancing, which has been going on the whole night, ceases, and the drums intone a peculiar beat, that of the *ioba*.³ The spirits know the beat, and they prepare for their return journey. Such is the

¹ Thus dancing in general is inaugurated by the initiation of the drums (*katuvivisa kasausa'u*), which is connected with the *katukuala*. The *kaidebu* have to be initiated separately by a *katuvivisa kaidebu*.

² There are names for each day about full moon. Thus the day (and night) of the full moon are called *Yapila* or *Kaitaulo*. One day before, *Yamkevila*; two days, *Ulakaiwa*. The day after full moon, *Valaita*; the following one, *Woulo*. The *ioba* takes place on the night of *Woulo*.

³ The drums of the Kiriwinians consist of: (1) the large drum (normal size of New Guinea drum) called *kasausa'u* or *kupi* (this latter word being an obscene synonym for the *glans penis*): and (2) the small drum, about one-third the size of the larger, called *katunenia*. All their drum-beats are a combination of the two drums, the *kupi* and the *katunenia* leading each its separate voice. The *ioba* beat can be noted:

kupi

katunenia



power of this beat that if somebody struck it a couple of nights earlier, all the *baloma* would leave the village, and go to their home in the nether world. The *ioba* beat is therefore strictly tabooed whilst spirits are in the village, and I could not prevail upon the boys in Olivilevi to give me a sample of this beat during the *milamala*, whereas, at a time when there were no spirits in the village (a couple of months before the *milamala*), I was able to obtain quite a performance of the *ioba* in Omarakana. Whilst the *ioba* beat is sounded on the drums, the *baloma* are addressed, entreated to go, and bidden farewell:

“ *Baloma, O !*
Bukulousi, O !
Bakalousi ga
Yuhuhuhu”

“ O spirits, go away, we shall not go (we'll remain).” The last sound seems to be just a kind of scream, to rouse up the sluggish *baloma* and to spur them to go.

This *ioba*, which takes place as stated above, before sunrise on the night of *Woulo*, is the main one. It is meant to drive away the strong spirits, those that can walk. The next day, before noon, there is another *ioba*, called *pem ioba*, or chasing away the lame. It purports to rid the village of the spirits of women and children, the weak and the crippled. It is performed in the same manner, by the same beat and with the same words.

In both cases the *cortège* starts at the end of the village farthest from where the road to Tuma strikes the village grove (*weika*), so that no part of the village remains “unswept.” They go through the village, stopping for a time on the *baku* (central place), and then they walk up the place, where the road to Tuma leaves the village. There they finish the *ioba*, and always end up with a beat of a peculiar form of dance, the *kasawaga*.¹

This concludes the *milamala*.

This information, as it stands here, was collected and written down before I had an opportunity of witnessing the *ioba* in Olivilevi. It is correct in all points, it is complete and detailed. I was even told by my informants that the drums are beaten by the young boys only, and that the elder men do not take much part in the *ioba*. Yet, in no instance, perhaps, of my field work, have I had such a striking demonstration of the necessity of witnessing things oneself, as I had when I made

¹ There are two main types of dance in Boiowa. The circular dances, where the orchestra (the drums and the singers) stand in the middle, and the performers go round them in a circle, always in the opposite direction to the hands of a watch. These dances are again subdivided into: (1) *bisila* (pandanus streamer) dances with slow movement; (2) *kitatua* (two bunches of leaves), with a quick movement; and (3) *kaidebu* (wooden painted shield), dances with the same quick movement. In the *bisila* dances women can take part (very exceptionally), and all the performers wear women's petticoats. The second group of dances are the *kasawaga*, where only three men dance, always in imitation of animal movements, though these are very conventionalized and unrealistic. These dances are not circular, there are no songs (as a rule) to accompany them; the orchestra consists of five *kupi* drums and one *katunenia*.

the sacrifice of getting up at three in the morning to see this ceremony. I was prepared to witness one of the most important and serious moments in the whole customary cycle of annual events, and I definitely anticipated the psychological attitude of the natives towards the spirits, their awe, piety, etc. I thought that such a crisis, associated with a well-defined belief, would, in one way or another, express itself in outward form, that there would be a "moment" passing over the village. When I arrived at the *baku* (central place), half an hour before sunrise, the drums were still going on and there were still a few of the dancers sleepily moving round the drummers, not in regular dance, but in the rhythmic walk of the *karibom*. When the *saka'u* was heard, everybody went quietly away—the young people in pairs, and there remained to farewell the *baloma* only five or six urchins with the drums, myself and my informant. We went to the *kadumalagala valu*—the point where the path for the next village leaves the settlement, and we started to chase the *baloma*. A more undignified performance I cannot imagine, bearing in mind that ancestral spirits were addressed! I kept at a distance, so as not to influence the *ioba*—but there was little to be influenced or marred by an ethnographer's presence! The boys from six to twelve years of age sounded the beat, and then the smaller ones began to address the spirits in the words I had been previously given by my informants. They spoke with the same characteristic mixture of arrogance and shyness, with which they used to approach me, begging for tobacco, or making some facetious remark, in fact, with the typical demeanour of boys in the street, who perform some nuisance sanctioned by custom, like the proceedings on Guy Fawkes' day or similar occasions. And so they went through the village, and hardly any grown-up man was to be seen. The only other sign of the *ioba* was some wailing in a house where a death had recently occurred. I was told it was the right thing to wail at the *ioba* as the *baloma* of the kindred were just leaving the village. Next day, the *pem ioba* was a still more paltry affair: the boys doing their part with laughter and jokes, and the old men looking on with smiles, and making fun of the poor lame spirits, which have to hobble away. Yet there is no doubt that the *ioba*, as an event, as a critical point in tribal life, is a matter of importance. It would never on any account be omitted.¹ As already noted, it would not be performed except at the proper moment, and the *ioba* drum beat must not be trifled with. But in its performance it has no traces of sanctity or even seriousness.

There is one fact in connection with the *ioba* which must be mentioned in this place, as in a way it may seem to qualify the general statement made at the beginning of this article, that there is no connection between the mortuary ceremonies and the lot of the spirit that has departed. The fact in point is, that the final casting off of mourning (called "washing of the skin," *iwini wowoula*, literally "he or she washes her skin") always takes place after a *milamala* on the day following the *ioba*. The underlying idea would seem to be that the mourning is still kept during the *milamala*, as the spirit is there to see it, and as soon as

¹ When a village is in mourning (*bola*), and drums are taboo, the *ioba* is performed by means of a conch shell (*ta'uiio*)—but it must not be omitted even under such circumstances.

this spirit departs, the "skin is washed." But strangely enough I never found the natives either volunteering this explanation or even endorsing it. Of course, when you ask the question, "Why do you perform washing of the skin just after the *ioba*?" you receive the invariable answer, "*Tokua bogwa bubunemasi*"—"our old custom." You then have to beat about the bush, and finally ask the leading question. And to this (as to all leading questions which contain an untrue or doubtful statement) the natives always answer in the negative, or else they consider your view as a new one, and throwing some light on the problem, but such consideration and acquiescence is at once distinguishable from a direct endorsement of a statement. There was never the slightest difficulty in deciding whether an opinion obtained was a customary, well established, orthodox native view, or whether it was an idea new to the native mind.¹

Some general remarks about the natives' attitude towards the *baloma* during *milamala* may follow this account of details. This attitude is characterized by the manner in which the natives speak about them, or behave during the ceremonial performances; it is less tangible than customary items, and more difficult to describe, but it is a fact, and as such must be stated.

The *baloma*, during their stay, never frighten the natives, and there is not the slightest uneasiness felt about them. The small tricks they play in showing their anger, etc. (see above), are done in broad daylight and there is nothing at all "uncanny" about them.

¹ The dread of "leading questions," as expressed over and over again in all instructions for ethnographical field work is, according to my experience, one of the most misleading prejudices. "Leading questions" are dangerous with a new informant, for the first half hour or couple of hours, at the outside, of your work with him. But any work done with a new, and consequently bewildered, informant is not worth being recorded. The informant must know that you want from him exact and detailed statements of fact. A good informant, after a few days, will contradict and correct you even if you make a *lapsus linguae*, and to think of any danger from leading questions in such a case is absolutely groundless. Again, real ethnographical work moves much more in statement of actual details, details which, as a rule, can be checked by observation—where again there is in no case any danger from leading questions. The only case where direct questioning is necessary, where it is the only instrument of the ethnographer, is when he wants to know what is the interpretation of a ceremony, what is his informant's opinion about some state of things; then leading questions are absolutely necessary. You might ask a native "What is your interpretation of such and such a ceremony?" and wait for years before getting your answer (even if you knew how to word it in native language). You would more or less solicit the native to take up your attitude, and look at things in ethnographical perspective. Again, when dealing with facts that are just out of range of immediate observation, like customs of war, and some of the obsolete technological objects, it is absolutely impossible to work without leading questions, if many important features are not to be omitted, and as there is no earthly reason to avoid this type of questioning, it is directly erroneous to brand the leading questions. Ethnological enquiry and judicial examination are essentially different, in that in the latter the witness has usually to express his personal, individual opinion, or to relate his impressions, both of which can be easily modified by suggestion: whereas in ethnological enquiry the informant is expected to give such eminently crystallized and solidified items of knowledge as an outline of certain customary activities, or a belief or a statement of traditional opinion. In such cases a leading question is dangerous only when dealing with a lazy, ignorant, or unscrupulous informant—in which case the best thing is to discard him altogether.

At night the natives are not in the least afraid to walk about alone from village to village, whereas they are distinctly afraid of doing so for some time after a man's death (see above). Indeed, this is the period of amorous intrigues, which entail lonely walks, and walks in couples. The most intense period of *milamala* coincides with full moon, where the superstitious fear of night is naturally reduced to its minimum. The whole country is gay with the light of the moon, with the loud beat of drums, and with the songs which resound all over the place. By the time a man is out of the radius of one village, he hears the music from the next. There is nothing of any oppressive atmosphere of ghosts, of any haunting presence, quite the reverse. The mood of the natives is gay and rather frivolous, the atmosphere in which they live pleasant and bright.

Again, it is to be noted that, though there is a certain amount of communion between the living and the spirits by dreams, etc., the latter are never supposed to influence in any serious way the course of tribal affairs. No trace of divination, taking counsel with the spirits, or any other form of customary communion in matters of any importance, is to be detected.

Apart from the lack of superstitious fear, there are no taboos connected with the behaviour of the living towards the spirits. It can be even safely asserted that not too much respect is paid to them. There is no shyness whatever in speaking about the *baloma*, or mentioning the personal names of such as are presumably present in the village. As mentioned above, the natives make fun of the lame spirits, and in fact all kind of jokes are passed about the *baloma* and their behaviour.

Again, except in the cases of people recently dead, there is little personal feeling about the spirits. There are no provisions for singling out individual *baloma* and preparing a special reception for them, excepting perhaps the gifts of food solicited in dreams by individual *baloma*.

To sum up : the *baloma* return to their native village, like visitors from another place. They are left to a great extent to themselves. Valuables and food are displayed to them. Their presence is by no means a fact constantly in the native's mind, or foremost in his anticipations of, and views about, the *milamala*. There is not the slightest scepticism to be discovered in the mind of the most civilized natives as to the real presence of the *baloma* at the *milamala*. But there is little emotional reaction with reference to their presence.

So much about the annual visit of the *baloma* during the *milamala*. The other form in which they influence tribal life is through the part they take in magic.

V.

Magic plays an enormous part in the tribal life of the Kiriwinians (as it undoubtedly does with the majority of native peoples). All important economic activities are fringed with magic, especially such as imply pronounced elements of chance, venture, or danger. Gardening is completely wrapped up in magic ; the

little hunting that is done has its array of spells; fishing, especially when it is connected with risk and when the results depend upon luck and are not absolutely certain, is equipped with elaborate magical systems. Canoe building has a long list of spells, to be recited at various stages of the work, at the felling of the tree, at the scooping out of the dugout; and, towards the end, at painting, lashing together, and launching. But this magic is used only in the case of the larger sea-going canoes. The small canoes, used on the calm lagoon or near the shore, where there is no danger, are quite ignored by the magician. Weather—rain, sun and wind—have to obey a great number of spells, and they are especially amenable to the call of some eminent experts, or, rather, families of experts, who practise the art in hereditary succession. In times of war—when fighting still existed, before the white man's rule—the Kiriwinians availed themselves of the art of certain families of professionals, who had inherited war magic from their ancestors. And, of course, the welfare of the body—health—can be destroyed or restored by the magical craft of sorcerers, who are always healers at the same time. If a man's life be endangered by an attempt on the part of the above-mentioned *mulukuausi*, there are spells to counteract their influence, though the only safe way to escape the danger is to apply to a woman who is a *mulukuausi* herself—there is always some such woman in a distant village.

Magic is so widespread that, living among the natives, I used to come across magical performances, very often quite unexpectedly, apart from the cases where I arranged to be present at a ceremony. The hut of Bagido'u, the garden magician of Omarakana, was not fifty metres from my tent, and I remember hearing his chant on one of the very first days after my arrival, when I hardly knew of the existence of garden magic. Later on I was allowed to assist at his chanting over magical herbs; in fact, I could enjoy the privilege as often as I liked, and I used it several times. In many garden ceremonies part of the ingredients are chanted over in the village, in the magician's own house, and, again, before being used in the garden. On the morning of such a day the magician goes alone into the bush, sometimes far away, to fetch the necessary herbs. In one charm as many as ten varieties of ingredients, practically all herbs, have to be brought. Some are to be found on the sea-beach only, some must be fetched from the *raiboag* (the stony coral woodland), others are brought from the *odila*, the low scrub. The magician has to set out before daybreak and obtain all his material before the sun is up. The herbs remain in the house, and somewhere about noon he proceeds to chant over them. A mat is spread on the bedstead, and on this mat another is laid. The herbs are placed on one half of the second mat, the other half being folded over them. Into this opening the magician chants his spell. His mouth is quite close to the edges of the mat, so that none of his voice can go astray; all enters the yawning mat, where the herbs are placed, awaiting to be imbued with the spell. This catching up of the voice, which carries the spell, is done in all magical recitations. When a small object has to be charmed, a leaf is folded so as to form a tub and at the narrow end of this the object is placed, while the magician

chants into the broad end. To return to Bagido'u and his garden magic. He would chant his charm for about half an hour, or even longer, repeating the spell over and over again, repeating various phrases in it and various important words in a phrase. The spell is sung in a low voice, there being a peculiar, half-melodic fashion of recital, which slightly varies with the divers forms of magic. The repetition of the words is a kind of rubbing-in of the spell into the substance to be medicated.

After the garden magician has finished his spell, he wraps up the leaves in the mat and puts them aside, to be presently used in the field, usually the next morning. All actual ceremonies of garden magic take place in the field, and there are many spells which are chanted in the garden. There is a whole system of garden magic consisting of a series of complex and elaborate rites, each accompanied by a spell. Every gardening activity must be preceded by a proper rite. Thus there is a general inaugurative rite, previous to any work in the gardens whatever, and this rite is performed on each garden plot separately. The cutting down of the scrub is introduced by another rite. The burning of the cut and dried scrub is in itself a magical ceremony, and it brings in its wake minor magical rites performed for each plot, the whole performance extending over four days. Then, when the planting begins, a new series of magical acts takes place, which lasts for a few days. Again, the weeding and the preliminary digging are introduced by magical performances. All these rites form, as it were, a frame, into which the garden work is fitted. The magician orders rest periods, which have to be observed, and his work regulates the work of the community, forcing all the villagers to perform certain labours simultaneously, and not to lag behind or be too far in advance of the others.

His share is very much appreciated by the community; indeed, it would be difficult to imagine any work done in the gardens without the co-operation of the *towosi* (garden magician).¹

In the management of gardens the *towosi* has a great deal to say, and great respect is shown to his advice, a respect which is in reality purely formal, because there are very few controversial, or even doubtful, questions about gardening. Nevertheless, the natives appreciate such formal deference and acknowledgment of authority to a degree which is really astonishing. The garden magician receives also his payment, which consists of substantial gifts of fish offered him by the members of the village community. It must be added that the dignity of village magician is usually vested in the person of the village headman, though this is not

¹ A characteristic fact to illustrate this statement is furnished by a Scotchman, who has been living for years among the natives as trader and pearl buyer. He has in no way lost the "caste" and dignity of the white man, in fact, he is an extremely kind, hospitable gentleman; nevertheless, he has assumed certain native peculiarities and habits such as the chewing of areca nut, a habit seldom adopted by white men. He is also married to a Kiriwinian. In order to make his garden thrive, he uses the help of a native *towosi* (garden wizard) from the next village, and that is the reason, my informants told me, that his garden is always considerably better than that of any other white man.

invariably the case. But only a man who belongs by birth to a certain village, whose maternal ancestors have always been the lords of that village and of that soil, can "strike the soil" (*ivoie buiagu*).

In spite of its great importance, Kiriwinian garden magic does not consist in any stately, sacred ceremonies, surrounded with strict taboos, performed with as much display as the natives can afford. On the contrary, any person uninitiated into the character of Kiriwinian magic might walk through the most important ceremony without being aware that anything of importance is going on. Such a person might come across a man scratching the soil with a stick, or making a small heap of dried branches and stalks, or planting a taro tuber, and perhaps muttering some words. Or else the imaginary spectator would walk through a Kiriwinian new garden field, with its soil freshly moved and cleared, with its diminutive forest of stems and sticks put into the ground to serve as supports for the *taitu*, a field which will presently look like a hop garden, and in such a walk he might meet a group of men, halting here and there and adjusting something in the corner of each garden plot. Only when loud spells are chanted over the fields would the visitor's attention be directly drawn to the magical reality of the performance. In such cases the whole act, otherwise insipid, assumes some dignity and impressiveness. A man may be seen standing alone, with a small group behind him, and addressing in a loud voice some unseen power, or, more correctly, from the Kiriwinian's point of view, casting this unseen power over the fields: a power which lies in the spell condensed there through the wisdom and piety of generations. Or voices may be heard all over the field chanting the same spell, as not seldom the *towosi* summons the help of his assistants, who consist always of his brothers or other matrilineal successors.

By way of illustration, let us go through one such ceremony—that consisting in the burning of the cut and dried scrub. Some herbs, previously chanted over, have to be wrapped, with a piece of banana leaf, round the tops of dried coconut leaflets. Leaves so prepared will serve as torches to set fire to the field. In the forenoon (the ceremony I witnessed in Omarakana took place about 11 a.m.), Bagido'u, the *towosi* of that village, went to the gardens accompanied by To'uluwa, his maternal uncle and headman of the village, and by some other people, among whom was Bokuioba, one of the headman's wives. The day was hot, and there was a slight breeze; the field was dry, so setting fire to it was easy. Everyone present took a torch—even Bokuioba. The torches were lit quite without ceremony (by means of wax matches, produced by the ethnographer, not without a pang), and then everyone went along the field on the windward side, and the whole was soon ablaze. Some children looked on at the burning, and there was no question of any taboo. Nor was there much excitement in the village about the performance, for we left a number of boys and children behind, playing in the village and not at all interested or inclined to come and see the rite. I assisted at some other rites, where Bagido'u and I were alone, though there was no taboo to prevent anyone who wished from being present. Of course, if anyone was present, a

certain minimum of decorum would be observed. The question of taboo, moreover, varies with the village, each having its own system of garden magic. I assisted at another garden burning ceremony (on the day following the wholesale burning, when a small heap of rubbish, together with some herbs, was burnt on each plot) in a neighbouring village, and there the *towosi* got very angry because some girls looked on at the performance from a fair distance, and I was told that the ceremonies were taboo to women in that village. Again, whereas some ceremonies are performed by the *towosi* alone, in others several people usually assist, while there are still others in which the whole village community has to take part. Such a ceremony will be described in detail below, as it bears more particularly on the question of the participation of the *baloma* in magic.

I have spoken here of garden magic only in order to illustrate the general nature of Kiriwinian magic. Garden magic is by far the most conspicuous of all magical activities, and the broad statements exemplified in this particular case hold good with reference to all other kinds of magic as well. All this is just intended to serve as a general picture, which must be kept in mind in order that my remarks about the part played by the *baloma* in magic may appear in the right perspective.¹

The backbone of Kiriwinian magic is formed by its spells. It is in the spell that the main virtue of all magic resides. The rite is there only to launch the spell, to serve as an appropriate mechanism of transmission. This is the universal view of all Kiriwinians, of the competent as well as of the profane, and a minute study of the magical ritual well confirms this view. It is in the formulæ, therefore, that the clue to the ideas concerning magic is to be found. And in the formulæ we find frequent mention made of the ancestral names. Many formulæ begin with long lists of such names, serving, in a way, as an invocation.

The question whether such lists are real prayers, in which an actual appeal is made to the ancestral *baloma*, who are supposed to come and act in the magic, or whether the ancestral names figure in the formulæ as mere items of tradition—hallowed and full of magical virtue, just because of their traditional nature—does not seem to allow of any definite decision either way. In fact, both elements are undoubtedly present: the direct appeal to the *baloma* and the traditional value of the mere ancestral names. The data given below should allow of closer determination. As the traditional element is closely bound up with the mode of inheritance of the magical formulæ, let us begin with the latter question.

The magical formulæ are passed from generation to generation, inherited from father to son in the paternal line, or from *kadala* (mat. uncle) to nephew in the maternal line, which, in native opinion, is the real line of kindred (*veiola*). The two forms of inheritance are not quite equivalent. There is a class of magic which may be termed local, because it is bound up with a given locality. To this

¹ The broad generalities given about Kiriwinian garden magic are, of course, not to be taken even as an outline of this magic, which, it is hoped, will be described in another paper.

class belong all the systems of garden magic,¹ as well as all such magical spells as are connected with certain spots endowed with magical properties. Such was the most powerful rain magic in the island, that of Kasana'i, which had to be performed in a certain waterhole in the *weika* (grove) of Kasana'i. Such was the official war magic of Kiriwina, which had to be performed by men belonging to Kuaibuaga, and which was associated with a *kaboma* (a sacred grove) near that village. Again, the elaborate systems of magic which were essential to shark and *kalala* fishing had each to be carried out by a man belonging to the village of Kaibuola or Laba'i respectively. All such formulæ were hereditary in the female line.²

The class of magic which is not bound up with locality, and which may be easily transmitted from father to son, or even from stranger to stranger, at a fair price, is much smaller. Here belong, in the first place, the formulæ of native medicine, which always go in couples, a *silami*, a formula of evil magic, the object of which is to produce illness, being always coupled with *vivisa*, a formula for annihilating the respective *silami*, and so curing the disease. The magic which initiates a man into the craft of carving, the *tokabitam* (carver) magic, belongs to this class, as well as the canoe-making charms. And a series of formulæ of minor importance, or at least of less esoteric character, such as love magic, magic against the bite of insects, magic against the *mulukuausi* (this latter rather important), magic for removing the bad effects of incest, etc. But even these formulæ, though they are not necessarily performed by the people of one locality, are usually associated with a locality. There is very often a myth at the bottom of a certain system of magic, and a myth is always local.³

Thus the more numerous examples, and certainly the more important class of magic (the "matrilineal" magic), is local, both in its character and in its transmission, whereas only part of the other class is distinctly local in its character. Now locality is in the mind and tradition of the Kiriwinian most intimately associated with a given family or subclan.⁴ In each locality the line of men who

¹ It should be remembered that each village has its own system of garden magic, intimately connected with that village, and transmitted in the maternal line. The membership in a village community is also transmitted in the female line.

² I cannot deal here in detail with this rule, to which there are many apparent exceptions. This will be done in another place. The statement in the text ought to be amended: "hereditary in the female line in the long run." For instance, very often a father gives the magic to his son, who practises it during his lifetime, but this *sōa* cannot pass it on to his son unless he has married a girl of his father's clan, so that his son belongs to the original clan again. Cross-cousin marriage, prompted by this and similar motives, is fairly frequent, and is considered distinctly desirable.

³ Thus, for instance, the *kainagola*, one of the most powerful *silami* (evil spells), is associated with a myth localized in the villages of Ba'u and Buotalu. Again, certain canoe-building magic, called *wa'ingu*, contains references to a myth, the scene of which is the island of Kitava. Many other examples could be adduced.

⁴ The native name for a subclan is *dala*, cf. Seligman, *op. cit.*, p. 678, where the form *dalela* is *dala*, with the pronominal suffix of the third person, "his family." The author gives there the names of *dala* belonging to the four clans. They include the most important *dala*, but

have succeeded each other as its rulers, and who in turn performed those acts of magic essential to its welfare (such as garden magic), would naturally loom large in the minds of the natives. This probably is confirmed by the facts, for, as mentioned above, the names of matrilineal ancestors play a great part in magic.

Some examples may be given to confirm this statement, though the full discussion of the question must be deferred to another occasion, because it would be necessary to compare this feature with the other elements recurring in magic, and to this end the full reproduction of all the formulæ would be necessary. Let us begin with the garden magic. I have recorded two systems of this magic, that of the village of Omarakana called *kailuebila*, which is generally considered to be the most powerful; and the *montilakaiva* system, associated with the four small villages, Kupuakopula, Tilakaiva, Iourawotu', and Wakailuva.

In the Omarakana system of garden magic there are ten magical spells, each associated with a special act: one said while striking the ground on which a new garden is to be made; another in the ceremony initiating the cutting down of the scrub; another during the ceremonial burning of the cut, dried scrub, and so on. Out of these ten spells there are three in which reference is made to *baloma* of ancestors. One of those three is by far the most important, and it is said during the performance of several rites, at the cutting down ceremony, at the planting ceremony, etc.

This is the beginning:

" *Vatuvi, vatuvi* ; (repeated many times)
Vitumaga, imaga ;
Vatuvi, vatuvi ; (many times)
Vitulola, ilola :
Tubugu Polu, tubugu Koleko, tubugu Takikila,
Tubugu Mulabuaita, tubugu Kuaiudila,
Tubugu Katupuala, tubugu Buguabuaga, tubugu Numakala ;
Bilumava'u bilumam ;
Tabugu Muakenwa, tamagu Iowana "

After this follows the rest of the formula, which is very long, and which, in the main, describes the state of things which the formula is meant to produce, *i.e.*, it describes the growth of the garden, the ridding of the plants from all pests, blights, etc.

The correct translation of such magical formulæ presents certain difficulties. There are in them archaic expressions which the natives only partially understand,

there are many others. As Professor Seligman says, the members of each *dala* trace their origin to a common ancestor. Such an ancestor emerged originally out of a hole in the earth in a given locality. And, as a rule, the *dala* lives in, or near, that locality—very often the "hole" is in the grove surrounding the village, or even right in the village. These holes, called "houses" (*buala*), are, at present, either waterholes or stone heaps, or small shallow cavities. The hole mentioned by Professor Seligman on p. 679 is the one out of which emerged several of the most aristocratic *dala*. But this is an exception, the rule being one *buala*, one *dala*.

and even then it is extremely difficult to make them translate the meaning correctly into modern Kiriwinian. The typical form of a spell consists of three parts: (1) The introduction (called *u'ula* = lowest part of a stem, used also to denote something akin to our conception of cause); (2) The body of the spell (called *tapuala* = the back, the flanks, the rump); (3) The final part (*dogina* = the tip, the end, the peak; etymologically connected with *doga*, a tusk, a sharp, long tooth). Usually the *tapuala* is much more easy to understand and to translate than the other parts. The invocation of ancestors, or, more correctly, perhaps, the list of their names, is always contained in the *u'ula*.

In the *u'ula* just quoted, the first word, *vatuvi*, was not understood by my informant, Bagido'u, the *towosi* (garden magician), of Omarakana, or, at least, he was not able to translate it to me. On etymological grounds it can be translated, I think, by "cause" or "make."¹

The words *vitumaga imaga* are composed of the prefixes *vitu* (to cause), and *i* (third person, singular, verbal prefix); and of the root *maga*, which is composed again of *ma*, the root of come, and *ga*, a suffix often used, which plays merely the rôle of giving emphasis. The words *vitulola*, *ilola* are quite symmetrical with the former, only the root *lu*, "to go" (reduplicated into *lola*), figures instead of *ma*, to come.

In the list of ancestors, two points are to be noted: the first names are attached to the word *tubugu*, whereas the last but one is used with *tabugu*. *Tubugu* is a plural, and means "my grandfathers" (*gu* being the pronominal suffix of the first person); *tabugu* means "my grandfather" (in the singular). The use of the plural in the first group is connected with the fact that in each subclan there are certain names, which are the property of this subclan; and every member of this subclan must possess one of these ancestral names, though he may be called also by another non-hereditary name, by which he is known more generally. Thus, in the first part of the spell, not one ancestor of the name of Polu is addressed, but the magician invokes "all my ancestors of the name of Polu, all my ancestors of the name of Koleko," etc.

The second characteristic feature, which is also general in all such lists of ancestors, is that the last names are preceded by the words "*bilumava'u bilumam*," which broadly mean (without entering into a linguistic analysis) "you new *baloma*," and then the names of the few last ancestors are enumerated. Thus Bagido'u mentions his grandfather, Muakenuva, and his father, Iowana.² This is important,

¹ I am almost certain that it is an archaic form, connected with *vitu*, a prefix expressing causation. Thus, "to show the way," "to explain," *vitu loki*, is composed of *vitu*, to "cause," and *loki*, to "go there." There are a number of such causative prefixes in Kiriwinian, each possessing a different shade of meaning. In this place, of course, they cannot be discussed.

² This is an example of the above-mentioned exceptions to the matrilineal descent of certain magical formulæ. Iowana, father of Bagido'u, was the son of a *tabalu* (i.e., of one of the family who "own" Omarakana). His father, Puraiasi, gave him the magic, and as Iowana married Kadu Bulami, his cousin, a *tabalu* woman, he could transmit the magic to his son, Bagido'u, and the office of *towosi* (garden magician) thus returned to the *tabalu* subclan.

because it is a direct invocation of a *baloma*, "O thou *baloma*" (in "*bilumam*" the *m*' being the suffix of the second person). In the light of this fact, the ancestor names appear to be more likely invocations of the ancestral *baloma* than a simple enumeration, even though the ancestral names have an intrinsic, active, magical power.

In a free translation, the fragment may be rendered thus:—

"Cause! Make it! Be efficient!

Cause to come!

Cause to go!

My grandfathers of the name Polu, etc. . . .

And you, recent *baloma*, grandfather Muakenuva, and father Iowana."

This free translation leaves still a great deal ambiguous, but it must be emphatically stated that this ambiguity does exist in the mind of the man who is best acquainted with the formula. Asked, what had to go and what to come, Bagido'u expressed his opinion in guesses. Once he told me that the reference was to the plants which have to enter the soil; on another occasion he thought that the garden pests are to go. Whether "come" and "go" are meant to be antithetical or not, was not clear either. The correct interpretation must, I think, insist on the very vague meaning of the *u'ula*, which is merely a kind of invocation. The words are believed to embody some hidden virtue, and that is their main function. The *tapuala*, which presents no ambiguities, explains the exact purpose of the spell.

It is also noteworthy that *u'ula* contains rhythmical elements in the symmetry in which the four groups of words are placed. Again, though the number of times the word *vatuvi* is repeated varies (I have heard the formula actually chanted several times), it is repeated the same number of times in both periods. The alliteration in this formula is undoubtedly also not accidental, as it is to be found in many other spells.

I have dwelt somewhat at length on this formula, treating it as representative of the others, which will be adduced without detailed analysis.

The second formula in which ancestor names are mentioned is spoken at the very first of the series of successive ceremonies at the *iowota*, when the *towosi* strikes the ground on which the gardens are going to be made. This formula begins:

" *Tudava, Tu-Tudava,*
Malita, Ma-Malita," etc.,

mentioning here the names of two ancestral heroes, about whom there exists a mythological cycle. *Tudava* is claimed to be in a way an ancestor of the *tabalu* (the most aristocratic subclan, who rule Omarakana), though there is no doubt that he belonged to the Lukuba clan (whereas the *tabalu* belong to the Malasi clan).

The same two names are invoked in another formula, which is spoken over

certain herbs, used in garden-planting magic, and over some structures of wood, made for magical purposes only, called *kamkokola*. This formula begins:

“*Kailola, lola ; Kailola, lola ;
Kaigulugulu ; kaigulugulu ;
Kailalola Tudava,
Kaigulugulu Malita,
Bisipela Tudava ; bisila'i otokaikaya,*” etc.

In free translation this means—

Go down [O you roots]; bore [into the ground, O you roots]; [help them] to go down, O Tudava; [help them] to bore [into the ground] O Malita; Tudava climbs up [lit. changes]; [Tudava] settles down on the *tokaikava* (i.e., the platform for the *baloma*).

In the Omarakana system of garden magic there are no special references to any sacred places near the village.¹ The only ritual action performed in connection with the *baloma* during a ceremony is of a very trifling character. After reciting the appropriate spell over the first taro planted in a *baleko* (a garden plot, the economic and magical unit in gardening), the magician constructs a miniature hut and fence of dry branches, called *si buala baloma* (“the *baloma*, their house”). No spells are said over it, nor could I discover any tradition, or obtain any further explanation in connection with this quaint act.

Another reference to the *baloma*, and a much more important one, though it does not take place during a ceremony, is the exposition or offering to the spirits of the *ula'ula*, the fee paid for the magic. The *ula'ula* is brought to the *torwosi* (garden magician) by the members of the community, and consists usually of fish, but there may be betel nuts or coconuts, or, nowadays, tobacco. This is exposed in the house; the fish only in the form of a small portion of the whole gift, and, as far as I know, in a cooked condition. While the magician chants over the magical leaves and implements in his house, previous to taking them out into the garden, the *ula'ula*, offered to the *baloma*, ought to be exposed somewhere near the medicated substance. This offering of the *ula'ula* to the *baloma* is not a feature particular to the Omarakana garden magic, but it obtains in all the other systems.

The other system (*momtilakaiva*), to which reference has been made, contains only one formula, in which there is a list of *baloma*. As this resembles that quoted above, the proper names only being different, I omit it here. In this system of magic, however, the rôle played by the *baloma* is much more pronounced, for in one of the main ceremonies, that of the *kamkokola*, there is an offering made to the *baloma*. The *kamkokola* are large, bulky erections, consisting of vertical poles some

¹ As a matter of fact, this system is imported from another village, Luebila, situated on the northern coast. Hence its name, *kailuebila*. It contains only one or two references to some places near that village, but it was not known in Omarakana whether those places were sacred or not.

3 to 6 metres high, and of slanting poles of the same length, leaning against the vertical poles. The two side poles of the *kamkokola* are propped against a lateral bifurcation of the erect pole, formed by the stump of a protruding branch. Seen from above, the constructions present a right-angle, or the shape of the letter L, with the vertical pole at the angle. From the side they look somewhat the shape of the Greek letter λ. These structures have no practical importance whatever, their only function being a magical one. They form the magical prototype, so to speak, of the poles put in the ground as supports for the *taitu* vine. The *kamkokola*, though they represent a merely magical item, require, nevertheless, a considerable amount of labour to erect. The heavy poles have to be brought very often from a great distance, as few are found near the villages in the low scrub, which is cut down every four or five years. For weeks men are busy searching for, felling, and bringing into their gardens the material for the *kamkokola*, and disputes about stealing the poles are frequent.

The *kamkokola* ritual occupies a couple of days in all the systems; four or more days are further taken up by the obligatory rest from all field-work, which precedes the magical performance. The first day of the magic proper is devoted, in the *montilakaiva* system, to the chanting over the fields. The magician, attended perhaps by one or two men, walks across the whole garden site—it was about three-quarters of a mile across country in the case which I witnessed—and on each garden plot he chants the spell, leaning on one of the slanting poles of the *kamkokola*. He faces the plot, and chants in a loud voice, which carries well over the whole plot. He has some thirty or forty such recitations to make.

It is the second day which is really of interest in this connection, for then a ceremony is performed in the gardens in which all the villagers take part, and in which the *baloma* also are said to participate. The object of this ceremony is to charm some leaves which will be put into the ground at the foot of the *kamkokola* and also at the junction of the vertical and the slanting poles. In the morning of this day the whole village is busy with preparations. The large earthenware pots used for boiling food on festive occasions are put on the stones which support them, and they bubble and steam while women move round and watch the cooking. Some women bake their *taitu* in the ground between two layers of red-hot stones. All the boiled and baked *taitu* will be brought out into the field, and there it will be ceremonially distributed.

In the meantime some men have gone into the bush, some have gone right down to the seashore, others to the *raiboag* (the rocky wooded ridge), in order to get the herbs necessary for the magic. Large bunches have to be brought, as after the ceremony the medicated herbs are distributed among all the men, each taking his share and using it on his own plot.

At about ten o'clock in the morning I went into the field, accompanied by Nasibowa'i, the *towosi* of Tilakaiva. He had a large ceremonial stone axe hanging over his shoulder which, indeed, he uses in several ceremonies, whereas Bagido'u of Omarakana never makes use of this instrument. Soon after we had arrived and

seated ourselves on the ground, waiting till all were present, the women began to troop in one after the other. Each was carrying a wooden dish with *taitu* on her head, often leading a child by the hand and carrying another astride on her flank. The spot where the ceremony had to be performed was at a point where the road from Omarakana entered the garden of Tilakaiva. On this side of the fence there was dense low scrub of a couple of years' growth; on the other the garden lay bare, the ground naked, the wooded ridge of the *raiboag* and several groves in the distance showing through the fairly dense agglomeration of poles planted as supports for the *taitu* vine. Two rows of specially fine ones ran along the path, forming a nice espalier in front of me. They terminated on this side with two specially fine *kamkokola*, at the foot of which the ceremony was to be performed, and which were to be supplied with herbs by the magician himself.

The women seated themselves all along the alley and on both sides in the fields. It took them about half an hour to collect, after which the food they brought was made into heaps, one heap for each man present, and each contribution was divided among the heaps. By this time all the men, boys, girls, and small children had arrived, and, the whole village being present, the proceedings began. The normal *sagali* (distribution) started the ceremony; a man walked past the heaps of food, and at each heap called out the name of one of those present, after which this portion (which had been placed on a wooden dish) was taken by a woman (a connection of the man called) and carried into the village. The women thus departed to the village, taking with them the babies and children. This part of the ceremony was said to be for the benefit of the *baloma*. The food thus distributed is called *baloma kasi* (food of the *baloma*), and the spirits are said to take some part in the proceedings, to be present there, and to be pleased with the food. Beyond these generalities, however, it was absolutely impossible to obtain a more definite or detailed statement from any of the natives, including Nasibowa'i himself.

After the women had departed, such of the small boys as remained behind were hunted away, as the ceremony proper was to begin. Even I and my "boys" had to step on the other side of the fence. The ceremony consisted simply of the recital of a spell over the leaves. Large bunches of these were put upon the ground on a mat, and Nasibowa'i squatted down in front of them and recited his spell right into the herbs. As soon as he had finished, the men pounced upon the leaves, each taking a handful, and running to his garden plot to put them under and on the *kamkokola*. This ended the ceremony, which with the waiting had lasted well over one hour.

Again, in the *momtilakaiva* magic, one of the spells refers to a "sacred grove" (*kaboma*), called Ovavavile. This place (a large clump of trees obviously not cut for many generations) is situated quite close to the villages of Omarakana and Tilakaiva. It is tabooed, swelling of the sexual organs (elephantiasis?) being the penalty for not observing the prohibition. I never explored its interior, for fear, not so much of the taboo, as of the small red ticks (scrub itch), which are a veritable pest. To

perform one of the magical rites, the *towosi* of Tilakaiva goes into this sacred wood and puts a large tuber of a species of yam called *kasi'iena* on a stone, this being an offering made to the *baloma*.

The spell runs:—

U'ula : “ *Avaita'u ikavakavala Ovavavala ?*

Iaegula'i Nasibowa'i,

Akavakavala Ovavavala ! ”

Tapuala : “ *Bala baise akavakavala, Ovavavala Iaegula'i Nasibowa'i akavakavala Ovavavala ; bala baise,*

Agubitamuaana, olopoulo Ovavavala ; bala baise

Akabinaiguadi olopoulo Ovavavala. ”

There is no *dogina* (final piece) in this formula. The translation runs as follows:—

“ Who bends down in Ovavavile ? ¹ I, Nasibowa'i (personal name of the present *towosi*) am bending down in Ovavavile ! I shall go there and bend down in Ovavavile ; I, Nasibowa'i, shall bend down in Ovavavile ; I shall go there and bear the burden [here the magician identifies himself with the stone on which the *kasi'iena* is put] within the *kaboma* of Ovavavile. I shall go there and bulge out [here he speaks in the name of the planted tuber] within the grove of Ovavavile.”

In this ceremony the association between the *baloma* and the magic is very slight, but it exists, and the connection with the locality affords another link between ancestral tradition and magic. So much concerning garden magic.

In the two most important systems of fish magic of Kiriwina—*i.e.*, the shark magic of the village of Kaibuola and the *kalala* (mullet ?) magic of the village of Laba'i—the spirits also play some part. Thus in both systems one of the ceremonies consists of an offering to the *baloma*, which is also subtracted from the *ula'ula* payment given to the magician by the people of his village. In the shark magic one of the rites takes place in the magician's house. The performer puts small parcels of the cooked fish (which he had received as *ula'ula*) and some coconut nut on one of the three stones (*kuilagila*), which are placed round a fireplace and serve to support the large cooking-pots. There he utters the following formula :

U'ula : “ *Kamkuamsi kami Ula'ula kubukuabwia, Inene'i, Ibuwigana P'iovalu, Vi'amoulo, Ulopoulo, Bowasa'i, Bomuagueda.* ”

Tapuala and Dogina : “ *Kukuavilasi poulo, kuminum kuaidasi poulo ; okawala Vilaita'u ; okawala Obuwabu ; Kulousi kuvapuagise vadola kua'u obuvarita, kulousi kuluvabowodasi kua'u obuvarita kuiaioiuvasi kukapuagegasi kumaise kuluvabodasi matami pualalala okotalela Vinaki.* ”

¹ *Ovavavala* is an archaic form of the name *Ovavavile*.

The *U'ula* may be translated:—

“Eat your *ula'ula* (gift, payment for magic), O unmarried women, Inene'i,”
etc. (all these are personal names of female *baloma*).

In the *tapuala* there are certain words I was unable to translate, but the general meaning is clear: “Spoil our fishing, bring bad luck to our fishing” (so far the spell is negative; it suggests in imperative form that which it is desired to prevent); — (?); — (?); “Go, open the mouth of the shark in the sea; go, make the shark to be met in the sea; remain open (yawning); come; make them meet the shark; your eyes are (?); on the beach of Vinaki.”

This fragmentary translation shows, at any rate, that the *bili baloma* (a plural form of *baloma*, used when they are treated as a kind of effective agent in magic) of the unmarried females are directly invoked to lend a hand in making the fishing lucky.

My informant was as puzzled as myself by the question why female and not male *baloma* are supposed to be effective in this magic. But it was a fact known, not only to the magician, but to everybody, that the female *baloma* are the *tolipoula*, the “masters of the fishing.” The magician and some other men in council tentatively suggested that the male *baloma* go out to the fishing with the men, and the female *baloma* remain behind and have to be fed by the magician, lest they should be angry. Another man pointed out that in the myth which explains the existence of the shark fishing in Kaibuola, a woman plays an important part. But it was clear that to all my informants the fact of women being *tolipoula* was so natural that it had never occurred to them to question it previously.

The *kalala* fishing in the village of Laba'i is connected with the mythical hero Tudava, who is specially associated with that village, and who is, in a way, reputed to be an ancestor of the present rulers of Laba'i. The magic which accompanies this fishing is essentially bound up with the mythological doings of Tudava. Thus, he lived on the beach where the fishing takes place and where the most important magical formulæ are spoken. Again, Tudava used to walk on the road leading from the beach to the village, and there are some traditional spots connected with his doings on that road. The “traditional presence,” if such an expression may be coined, of the hero is felt in all the fishing places. The whole neighbourhood is also enveloped in taboos, which are especially stringent when the fishing is going on. This is periodical, and lasts for about six days each moon, beginning on the *yapila* (the day of the full moon), when the fish are coming in shoals into the shallow water between the barrier reef and the beach. The native tradition says that Tudava ordered the *kalala* fish to live in “big rivers” on the d'Entrecasteaux Archipelago, and once a month to come up to the beach of Laba'i. But the magic spells, also ordered by Tudava, are essential, for if these were omitted the fish would not come. Tudava's name, coupled with those of other ancestors, figures in a long spell said at

the beginning of the fishing period on the beach near a large tabooed stone called Bomlikuliku.¹ The spell begins :—

“ *Tudava kulu Tudava ;*
Ibu'a kulu, Wa'ibua ;
Kuluvidaga, Kulubaiwoie, Kulubetoto,
Muaga'i, Karibuiwa,” etc.

Tudava and Wa'ibua are mythical ancestors who both belonged to the village of Laba'i, the first being, as we know already, the great “culture hero” of the island. Noteworthy is the play on the name Wa'ibua, evidently for purposes of rhythm. Again, the word *kulu* inserted between the two first names (that of Tudava and of Ibu'a and prefixed to the three following names) could not be translated by my informants, nor do I see any etymological solution of the difficulty. After, the personal names enumerated above follow eight names without a kinship term and sixteen with the kinship term *tubugu* (“my grandfathers”) preceding each. Then comes the name of the immediate predecessor of the present magician. My informant was unable to explain why some of the names were furnished with the kinship determination, whilst the others were not. But he was very positive that those two classes were not equivalent or interchangeable.

An offering is made daily to the *baloma* during the six days the fishing lasts. Small bits of cooked fish (about the size of walnuts) and bits of betel nut (now also tobacco) are put by the magician on the Bomlikuliku stone with the following words :—

“ *Kamkuamsi kami ula'ula, nunumuia :*
Ilikilalua, Ilibualita ;
Kulisasisama,”²

which mean—

“Eat your *ula'ula* (present for performing magic), O old women : Ilikilalua (personal name), Ilibualita (personal name); open it.”

This shark spell or invocation is repeated daily with each offering. Another charm, called *guvagava*, is chanted daily for the six days over some leaves; it has the power of attracting the *kalala* fish. The spell begins with a list of ancestors, all of them styled “ancestor” or “grandfather.”

There is a spell performed once only, at the beginning of the fishing period, on the road leading from the village of Laba'i to the beach. It is chanted over a plant

¹ *Bom'* is abbreviated from *boma*, which means taboo. *Likuliku* is an expression for earthquake, which is an important item in the magical vocabulary.

² *Kamkuam*, eat; *kami*, the personal prefix of the second person plural, used with food; *nunumuia*, plural of *numuia*, old woman. The two personal names of the *baloma* old women are remarkable for beginning with *ili*, very likely derived from *ilia*—fish. *Bualita* means sea. It seems thus possible that they are some mythical persons, associated with fishing, concerning whom the tradition has been lost. But such guesses have little charm, and still less value, in the opinion of the present writer.

(*libu*) uprooted from the soil and put across the path. In this spell there is the following phrase :—

“ *Iamuana iaegulo, Umnalibu*
Tai'ioko, Kubugu, Taigala, Likiba,”¹

which is also an enumeration of names, all of which are said to have belonged to the present magician's ancestors.

Another formula in which names of ancestors occur is that recited while the magician sweeps his house at the beginning of the fishing period. This spell begins :—

“ *Boki'u, Kalu Boki'u ; Tamala, Kuri Tamala ;*
Tageulo, Kuritageulo.”

All these are names of ancestors of the magician's subclan. Characteristic is the repetition of the names with a superadded prefix, “ *Boki'u Kalu Boki'u*,” etc. Whether the man's real name is represented by the first word and the second one is an embellished replica, or whether the first is only a curtailed second syllable of the real name, was not quite clear to my informants.

In the system of *kalala* fishing magic just discussed the number of formulæ in which ancestral names figure is five out of a total of seven, which makes a large proportion.

It would take up too much space to discuss in detail all the remaining magical formulæ which have been recorded. A synoptic table (see next page) will be sufficient as a basis for a short discussion.²

As mentioned above, there are the two classes of magic, the “matrilineal” and “patrilineal,” the former bound up with a locality, the latter often handed over from one place to another. It is also necessary in Kiriwinian magic to distinguish between magic which forms a system, and that which naturally consists of unconnected formulæ. The term “system” may be taken to denote that magic in which a number of formulæ form an organic consecutive whole. This whole is usually connected with activities which are also part of a large organic total—activities all of which are directed towards the same end. Thus it is quite clear

¹ The first name is that of a woman ; *iaegulo* means “I” ; *Iamuana* is said to have been the mother of *Umnalibu*. Here also the name is suggestive of some connection with the spell, which is said over the *libu* plant. The last name but one, *Taigala*, means, literally, his ear, but here it was said to stand for a *bili baloma* name.

² It must be stated that several of these formulæ have not been translated in a satisfactory manner. It was often impossible to secure the help of the man who recited the spell. Several spells were collected during short visits to outlying villages. In several cases the man was too old or too stupid to help in the, from the native point of view, extremely difficult and puzzling task of translating the archaic and condensed formula, and of commenting upon all its obscurities. And, as a rule, it is no use asking anyone but the original owner to translate or comment upon any formula. I have been able, however, from my knowledge of the “colloquial” language to grasp the general meaning of almost all the formulæ.

Description of magic.	Total number of formulæ recorded.	Number of formulæ in which ancestral names are mentioned.	Number of formulæ in which no ancestral names are mentioned.
1. Weather charms	12	6	6
2. War magic	5	—	5
3. <i>Kaitubutabu</i> (coconut magic)	2	1	1
4. Thunder	2	1	1
5. Sorcery and medicine	19	4	15
6. Canoe	8	—	8
7. <i>Muasila</i> (trading, exchange of wealth)	11	—	11
8. Love	7	—	7
9. <i>Kaiga'u</i> (<i>mulukuauasi</i> magic)	3	—	3
10. <i>Kabitam'</i> (carving charms)	1	—	1
11. Fishing magic	3	2	1
12. Sting ray fishing	1	—	1
13. <i>Wageva</i> (beauty magic)	2	—	2
14. Areca nut	1	—	1
15. <i>Saikenulo</i> (child magic)	1	—	1

that garden magic forms a system. Every formula is connected with some activity, and all together form a consecutive series tending towards one end. The same applies to magic performed at different stages of a fishing period or to magical formulæ said during the successive phases of a trading expedition. No single formula of such a system would be of any use. They must all be recited successively; they must all belong to the same system, and each must mark off some phase of the given activity. On the other hand, love magic consists of a number of spells (and they are innumerable in Kiriwina), every one of which forms an independent unit.

War magic (No. 2) again forms a system. All spells have to be recited, one after the other, in connection with consecutive magical activities. This system is connected with a certain locality, and references to this locality (and other places, too) are made, but no ancestor names are mentioned.

Weather magic (No. 1), chiefly rain magic and, less important, fine weather magic, is local and connected with a myth. The twelve spells all belong to one locality, and they are the most powerful rain magic in the island. They are the monopoly of the rulers of the village of Kasana'i (a small village, which forms practically one unit with the village of Omarakana), a monopoly which in times of drought brings an enormous income in gifts to the magician.

Again, in *kaitubutabu* magic (No. 3) the two formulæ are part of a system; they must both be said at two different stages of a period, during which coconuts

are tabooed, and the object of the whole series of observances and rites is to foster the growth of coconuts.

Thunder magic (No. 4) is connected with a tradition, in which there figures a mythical ancestor, and this is mentioned in the spell.

Canoe-making magic (No. 6) and *muasila* magic (No. 7), connected with a remarkable system of trading and exchange of valuables (called *kula*), form each an extremely important system of magic. No ancestral names are mentioned in the formulæ recorded. Unfortunately, I have not recorded any complete system of *muasila*, and though one system of canoe magic has been recorded, it could not be properly translated. In both forms of magic there are references to localities, but none to ancestors.

The three spells of fishing magic (No. 11) belong to one system.

The other spells (Nos. 12–15) do not form systems. In the love spells there is naturally no mention of ancestral names. The only formulæ where such names appear are those designed to bring a disease upon a man or to exorcise it. Some of these charms are associated with myths.

The data here given concerning the rôle of ancestors in magic must speak for themselves. It has not been possible to obtain much additional information from natives upon this subject. The references to the *baloma* form an intrinsic and essentially important part of the spells in which they occur. It would be no good asking the natives "What would happen if you omitted to invoke the *baloma*?" (a type of question which sometimes reveals the ideas of the native as to the sanction or reason for a certain practice), because a magical formula is an inviolable, integral item of tradition. It must be known thoroughly and repeated exactly as it was learnt. A spell or magical practice, if tampered with in any detail, would entirely lose its efficacy. Thus the enumeration of ancestral names cannot conceivably be omitted. Again, the direct question, "Why do you mention those names?" is answered in the time-honoured manner, *Tokunaboqu bubunemasi* "our (excl.) old custom." And in this matter I did not profit much from discussing matters with even the most intelligent natives.

That the names of the ancestors are more than a mere enumeration is clear from the fact that the *ula'ula* is offered in all the most important systems, which have been thoroughly examined, and also from the offerings and *sagali* described above. But even these presents and the partaking of the *sagali*, though undoubtedly they imply the presence of the *baloma*, do not express the idea of the spirits' actual participation in fostering the aim of the magic; of their being the agents through whom the magician works, to whom he appeals or whom he masters in the spell, and who perform subsequently the task imposed on them.

The natives at times express meekly the idea that a benevolent attitude of the spirit is very favourable to the fishing or gardening, and that if the spirits were angry they would do harm. This latter negative view was undoubtedly more pronounced. The *baloma* participate in some vague manner in such ceremonies as

are performed for their benefit, and it is better to keep on the right side of them, but this view by no means implies the idea that they are the main agents, or even the subsidiary agents, of any activity.¹ The magical virtue lies in the spell itself.

The native attitude of mind towards the *baloma* in magic may become more clear when compared with that obtaining during the *milamala*. There the *baloma* are participants and onlookers, whose favour ought to be gained, whose wishes are naturally respected, who, further, are not slow in showing their disapproval, and who can make a nuisance of themselves if not properly treated, though their anger is not nearly so terrible as that of the normal type of supernatural beings, savage or civilized. In the *milamala* the *baloma* are not real agents in anything that goes on. Their rôle is purely passive. And out of this passivity they can be roused only by being put into bad humour, when they begin to show their existence in a negative manner, so to speak.

There is another side to the lists of ancestral names in magic, which must be remembered here. In all Kiriwinian magic a great rôle is played by myths, underlying a certain system of magic, and by tradition in general. How far this tradition is local and how far it thus becomes focussed on the family tradition of a certain subclan has been discussed above. The ancestral names mentioned in the several formulæ form therefore one of the traditional elements so conspicuous in general. The mere sanctity of those names, being often a chain linking the performer with a mythical ancestor and originator, is in the eyes of the natives a quite sufficient *prima facie* reason for their recital. Indeed, I am certain that any native would regard them thus in the first place, and that he would never see in them any appeal to the spirits, any invitation to the *baloma* to come and act; the spells uttered whilst giving the *ula'ula* being, perhaps, an exception. But even this exception does not loom first and foremost in his mind and does not colour his general attitude towards magic.²

VI.

All these data bearing upon the relations between the *baloma* and the living, are, in a way, a digression from the story of the after-life of the *baloma* in Tuma, and to this let us now return.

We left the *baloma* settled to his new life in the nether world, more or less comforted concerning those left behind; having, very likely, married again and formed new ties and connections. If the man died young, his *baloma* is also young; but with time he will age, and finally his life in Tuma will also come to an end. If the man was old at his death, his *baloma* is old, and after a period his life in

¹ The full discussion of this subject must be deferred to another place. It is interesting that in a certain class of *silami* (evil spells) there is a direct invocation to a being, *tokuay* (a wood spirit living in trees), to come and perform the evil. And everybody agrees that it is the *tokuay* who is the *w'ula* (basis, reason, cause) of the *silami*, that he enters the body and produces disastrous internal disorders.

² All these general statements must be regarded as preliminary, they will be supported by proper documents in the proper place.

Tuma will also cease.¹ In all cases the end of the life of the *baloma* in Tuma brings with it a very important crisis in the cycle of his existence. This is the reason why I have avoided the use of the term death in describing the end of the *baloma*.

I shall give a simple version of these events and discuss the details subsequently. When the *baloma* has grown old, his teeth fall out, his skin gets loose and wrinkled; he goes to the beach and bathes in the salt water; then he throws off his skin just as a snake would do, and becomes a young child again; really an embryo, a *waiwaia*—a term applied to children *in utero* and immediately after birth. A *baloma* woman sees this *waiwaia*; she takes it up, and puts it in a basket or a plaited and folded coconut leaf (*puatai*). She carries the small being to Kiriwina, and places it in the womb of some woman, inserting it *per vaginam*. Then that woman becomes pregnant (*nasusuma*).²

This is the story as I obtained it from the first informant who mentioned the subject to me. It implies two important psychological facts: the belief in reincarnation, and the ignorance of the physiological causes of pregnancy. I shall now discuss both these subjects in the light of the details obtained on further inquiry.

First of all, everybody in Kiriwina knows, and has not the slightest doubt about, the following propositions. The real cause of pregnancy is always a *baloma*, who is inserted into or enters the body of a woman, and without whose existence a woman could not become pregnant; all babies are made or come into existence (*ibubulisi*) in Tuma. These tenets form the main stratum of what can be termed popular or universal belief. If you question any man, woman, or even an intelligent child, you will obtain from him or her this information. But any further details are much less universally known; one obtains a fact here and a detail there, and some of them contradict the others, and none of them seems to loom particularly clear in the native mind, though here and there it is obvious that some of these beliefs influence behaviour, and are connected with some customs.

First, as to the nature of these "spirit children," *waiwaia*.³ It must be kept in mind that, as is usual in dogmatic assertions, the natives take very much for granted, do not trouble to give clear definitions or to imagine details very

¹ Compare those data with the above discussed "ignorance of natural death." In this ignorance there ought to be distinguished: (1) the ignorance of the necessity of death, of the life coming to an end; (2) ignorance of the natural causes of sickness as we conceive it. Only the second ignorance seems to be quite prevalent, the action of evil sorcerers being always assumed, except, perhaps, in the above-mentioned cases of very old and insignificant folk.

² *Suma* is the root for pregnancy; *nasusuma*, a pregnant woman; *isume*, she becomes pregnant. There is no term denoting conception, as distinguished from pregnancy. The general meaning of *suma* is "take," "take possession of."

³ I am using here the expression "spirit child" as a *terminus technicus*. This is the term used by Spencer and Gillen to denote analogous beings in Australia, where this type of reincarnation was first discovered. How far the Kiriwinian facts are ethnographically or psychologically connected with those described by Spencer and Gillen will not be discussed in this place.

concretely and vividly. The most natural assumption—namely, that, of the “spirit child” being a small undeveloped child, an embryo—is the most frequently met with. The term *waiwaia*, which means embryo, child in the womb, and also infant immediately after birth, is also applied to the non-incarnated spirit children. Again, in a discussion on this subject, in which several men took part, some asserted that the man, after his transformation in Tuma, becomes just some sort of “blood,” *buia’i*. In what manner he could be subsequently transported in such liquid form was not certain. But the term *buia’i* seems to have a slightly wider connotation than fluid blood merely, and it may mean something like flesh in this case.

Another cycle of beliefs and ideas about reincarnation implies a pronounced association between the sea and the spirit children. Thus I was told by several informants that after his transformation into a *waiwaia*, the spirit goes into the sea. The first version obtained (quoted above) implied that the spirit, after having washed on the sea beach and become rejuvenated, is taken up immediately by a female *baloma* and carried to Kiriwina. Other accounts state that the spirit, after being transformed, goes into the sea and dwells there for a time. There are several corollaries to this version. Thus in all the coastal villages on the western shore (where this information was collected) mature unmarried girls observe certain precautions when bathing. The spirit children are supposed to be concealed in the *popewo*, the floating sea scum; also in some stones called *dukupi*. They come along on large tree trunks (*kaibilabala*), and they may be attached to dead leaves (*libu-libu*) floating on the surface. Thus when at certain times the wind and tide blow plenty of this stuff towards the shore, the girls are afraid of bathing in the sea, especially at high tide. Again, if a married woman wants to conceive, she may hit the *dukupi* stones in order to induce a concealed *waiwaia* to enter her womb. But this is not a ceremonial action.¹

In the inland villages the association between conception and bathing is also known. To receive the *waiwaia* whilst in the water seems to be the most usual way of becoming pregnant. Often whilst bathing a woman will feel that something has touched her, or even hurt her. She will say, “A fish has bitten me.” In fact, it was the *waiwaia* entering or being inserted into her.

Another rather important connection between the belief of the *waiwaia* dwelling in the sea and conception is expressed in the only important ceremony connected with pregnancy. About four to five months after the first symptoms of pregnancy the woman begins to observe certain taboos, and at the same time a large and long *dobe* (grass petticoat) is made (called *saikewulo*), which she will wear after the birth of the child. This is made by certain female relatives, who also perform magic over

¹ This information was obtained from a woman on the west coast. I think the woman belonged to the village of Kavataria. Mr. G. Auerbach, a pearl buyer, who resides in Sinaketa, a coastal village on the southern half of the island, told me that there are some stones there, to which a woman who wants to become enceinte may have recourse. My informant was unable to tell me whether this was ceremonial or not.

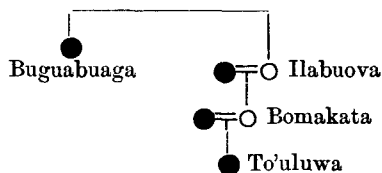
it, in order to benefit the child. On the same day the woman is taken to the sea, where relatives of the same class as those that made the *saikeulo* bathe her in the salt water. A *sagali* (ceremonial distribution of food) follows the proceedings.

The usual explanation of the *u'ula* (reason) for this ceremony is that it makes the "skin of the woman white," and that it makes the birth of the baby easier.¹ But in the coastal village of Kavataria a very definite statement was volunteered, to the effect that the *kokuwa* ceremony is connected with incarnation of the spirit children. The view taken by one of my informants was that during the first stage of pregnancy the *waiwaia* has not really entered the woman's body, but that there is merely a kind of preparation made for its reception. Then, during the ceremonial bathing, the spirit child enters the body of the woman. Whether this volunteered interpretation was only his opinion or whether it is a universal belief in the coastal villages, is not known to me, but I am inclined to believe that it does represent an aspect of the coastal natives' belief. But it must be emphatically stated that this interpretation was absolutely pooh-poohed by my informants of the inland villages, who also pointed out the contradiction that this ceremony is performed later on, during pregnancy, and that the *waiwaia* has been established long ago in the mother's womb. It is characteristic that any inconsistency is noted in a view which is not the informant's own standpoint, while similar contradictions are most blandly overlooked in his own theories. The natives are, remarkably enough, not a whit more consistent on this point or intellectually honest than civilized people.

Besides the belief in reincarnation by action of the sea, the view that the *waiwaia* is inserted by a *baloma* is prevalent. These two ideas blend in the version that the *baloma* who inserts the *waiwaia* does it under water. The *baloma* often appears in a dream to the prospective mother, who will tell her husband: "I dreamed that my mother (or maternal aunt, or my elder sister or grandmother) inserted a child into me; my breasts are swelling." As a rule, it is a female *baloma* that appears in the dream and brings the *waiwaia*, though it may be a man, but the *baloma* must always be of the *veiola* (maternal kindred) of the woman. Many know who brought them to their mother. Thus To'uluwa, the chief of Omarakana, was given to his mother (Bomakata) by Buguabuaga, one of her *tabula* ("grandfathers"—in this case her mother's mother's brother).² Again, Bvoilagesi,

¹ There is a remarkable rule which compels the woman to perform all sorts of practices in order to have her skin quite light after childbirth; she keeps in the house, she has to wear the *saikeulo* over her shoulders, she washes with hot water, and frequently puts coconut cream on her skin. The degree of lightness of skin thus achieved is remarkable. The above described ceremony is a kind of magical inauguration of the period when she will have to keep her skin light.

² A genealogy shows the relationship in an instant—



The black discs represent males, the rings, females.

the woman mentioned on page 364, who goes to Tuma, had her son, Tukulubakiki, given her by Tomnavabu, her *kadala* (mother's brother). Tukulubakiki's wife, Kuwo'igu, knows that her mother came to her, and gave her the baby, a girl now about twelve months old. Such knowledge is possible only in the cases when the *baloma* actually appears in a dream to the woman and tells her that he will insert a *waiwaia* into her. Of course, such annunciations are not absolutely in the programme; indeed, the majority of people do not know who it is to whom they owe their existence.

There is one extremely important feature of the beliefs about reincarnation, and however opinions differ about the other details, this feature is stated and affirmed by all the informants; namely, that the social division, the clan and subclan of the individual, is preserved through all his transformations. The *baloma*, in the nether world, belongs to the same subclan as the man before death; and the reincarnation moves also strictly within the boundaries of the subclan. The *waiwaia* is conveyed by a *baloma* belonging to the same subclan as the woman, as just stated, the carrier is even as a rule some near *veiola*. And it was considered absolutely impossible that any exception to this rule could happen, or that an individual could change his or her subclan in the cycle of reincarnation.¹

So much about the belief in reincarnation. Though it is a universal and popular belief, *i.e.*, though it is known to everybody, it does not play an important rôle in social life. The last mentioned detail only about the persistence of kinship ties throughout the cycle is decidedly a belief illustrating the strength of the social division, the finality of belonging to a social group. Conversely, this belief must strengthen those ties.

VII.

It might seem quite safe to say that the belief in reincarnation, and the views about a spirit child being inserted into, or entering, the womb of the mother, exclude any knowledge of the physiological process of impregnation. But any drawing of conclusions, or arguing by the law of logical contradiction, is absolutely futile in the realm of belief, whether savage or civilized. Two beliefs, quite contradictory to each other on logical grounds, may co-exist, while a perfectly obvious inference from a very firm tenet may be simply ignored. Thus the only safe way for an ethnological inquirer is to investigate every detail of native belief, and to mistrust any conclusion obtained through inference only.

The broad assertion that the natives are entirely ignorant of the existence of physiological impregnation may be laid down quite safely and correctly. But though the subject is undoubtedly difficult, it is absolutely necessary to go into details in order to avoid serious mistakes.

¹ The majority of my informants were equally positive about the rule that a *baloma* of the *veiola* must convey the child. But I have come across one or two dissenting opinions, affirming that the father's mother may bring the child. It was said by one man that if the child resembles the mother it has been brought by some of her *veiola*; if it resembles the father it has been brought by his mother. But this opinion may be my informant's private speculation.

One distinction must be made at the outset : the distinction between impregnation, that is the idea of the father having a share in building up the body of the child on the one hand, and the purely physical action of sexual intercourse on the other. Concerning the latter, the view held by the natives may be formulated thus : it is necessary for the woman to have gone through sexual life before she can bear a child.

I was forced to make the above distinction under the stress of the information I was gathering, in order to explain certain contradictions which cropped up in the course of inquiries. And it must be therefore accepted as a "natural" distinction, as one which corresponds to and expresses the native point of view. In fact, it was impossible to foresee how the natives would look upon these matters, and from which side they would approach the correct knowledge of facts. Nevertheless, the distinction once made, its theoretical importance is obvious. It is clear that only the knowledge of the first fact (that of the father's share in impregnation) would have any influence in shaping native ideas about kinship. As long as the father does nothing to form the body of the child (in the ideas of a people), there can be no question of consanguinity in the agnatic line. A mere mechanical share in opening up the child's way into the womb, and out of it, is of no fundamental importance. The state of knowledge in Kiriwina is just at the point where there is a vague idea as to some *nexus* between sexual connection and pregnancy, whereas there is no idea whatever concerning the man's contribution towards the new life which is being formed in the mother's body.

I shall sum up the data which led me to make this statement. Beginning with ignorance of the father's share, to direct questions as to the cause (*u'ula*) of a child being created, of a woman becoming pregnant, I received the invariable answer, *baloma boge isaika*, "the *baloma* gave it."¹

Of course, like all questions about the *u'ula*, this one has to be put with patience and discrimination, and it may at times remain unanswered. But in the many cases when I put this question bluntly and directly, and when it was comprehended, I received this answer, though I must add here at once that it was at times complicated in an extremely puzzling manner by some hints about copulation. As I was puzzled by that, and as I was very keen on getting this point clear, I discussed it whenever it could be approached as a side issue, I put it *in abstracto*, and I discussed it very often in concrete instances wherever any special case of pregnancy, past or present, was the subject of conversation.

Specially interesting and crucial were the cases where the pregnant woman was not married.²

¹ In which, *nota bene*, by the *baloma* who "gave" the child, the natives mean either the original *baloma*, who has become the child, or the *baloma* who brought the *waiwaia*.

² The sexual freedom of unmarried girls is complete. They begin intercourse with the other sex very early, at the age of six to eight years. They change their lovers as often as they please, until they feel inclined to marry. Then a girl settles down to a protracted and, more or less, exclusive intrigue with one man, who, after a time, usually becomes her husband. Illegitimate children are by no means rare, cf. the excellent description of sexual life and

When I asked who was the father of an illegitimate child, there was only one answer, that there was no father, as the girl was not married. If, then, I asked, in quite plain terms, who is the physiological father, the question was not understood, and when the subject was discussed still further, and the question put in this form : "There are plenty of unmarried girls, why did this one get with child, and the others not," the answer would be : "It is a *baloma* who gave her this child." And here again I was often puzzled by some remarks, pointing to the view that an unmarried girl is especially exposed to the danger of being approached by a *baloma*, if she is very unchaste. Yet the girls deem it much better precaution to avoid directly any exposure to the *baloma* by not bathing at high tide, etc., than indirectly to escape the danger by being too scrupulously chaste.

Illegitimate, or according to the Kiriwinian ideas, fatherless children, and their mothers are, however, regarded with scant favour. I remember several instances in which girls were pointed out to me as being undesirable, "no good," because they had children out of wedlock. If you ask why such a case is bad, there is the stereotyped answer, "Because there is no father, there is no man to take it in his arms" (*Gala taitala Cikopoi*). Thus Gomaia, my interpreter, had had an intrigue, such as is usual before marriage, with Ilamueria, a girl of a neighbouring village. He had previously wanted to marry her. She had a child subsequently, and Gomaia married another woman. Asked why he did not marry his former sweetheart, he replied, "She had a child, this is very bad." Yet he was sure that she had never been unfaithful to him during the period of their "betrothal" (Kiriwinian youths are much the prey of such illusions). He had not the slightest idea about there being any question of fatherhood of the child. If he had he would have acknowledged the child as his own, because he believed in his sexual exclusiveness with regard to the mother. But the fact that it came at an improper time was enough to influence him. This by no means implies that a girl who has been a mother, finds any serious difficulty in marrying afterwards. During my stay in Omarakana, two such girls were married, without any comment. There are no unmarried women in what might be termed the "marriage age" (25–45 years), and when I asked whether a girl might remain a spinster because she had a child, the answer was an emphatic negative. All that has been said above about the *baloma* bringing a child, and the concrete cases adduced, must also be borne in mind in this connection.

When, instead of merely asking about the *u'ula* of pregnancy, I directly advanced the embryological view of the matter, I found the natives absolutely ignorant of the process suggested. To the simile of a seed being planted in the soil and the plant growing out of the seed, they remained quite irresponsible. They were curious, indeed, and asked whether this was "the white man's manner of doing it," but they were quite certain that this was not the "custom" of Kiriwina. The

marriage among the Southern Massim, who, in this respect, resemble the Kiriwinians to a great extent, in Seligman, *op. cit.*, chap. xxxviii, p. 499, and the short but correct account there given of the same subject among the Northern Massim (including the Trobriand Islanders), chap. liii, p. 708.

spermatic fluid (*momona*) serves merely the purposes of pleasure and lubrication, and it is characteristic that the word *momona* denotes both the male and female discharge. Of any other properties of the same they have not the slightest idea. Thus, any view of paternal consanguinity or kinship, conceived as a bodily relation between father and child, is completely foreign to the native mind.

The above-mentioned case of a native not being able to understand the question, Who is the father of an unmarried woman's child? can be supplemented by two other instances concerning married women. When I asked my informants what would happen if a woman became pregnant in her husband's absence, they calmly agreed that such cases might occur, and that there would be no trouble at all. One of them (I have not noted his name, and I do not remember it), volunteered his own case as an instance in point. He went to Samarai¹ with his white master, and stayed there for a year, as he said, during which time his wife became pregnant and gave birth to a child. He returned from Samarai, found the child, and it was all right. On further questioning, I came to the conclusion that the man was absent for about 8-10 months, so there is no urgent necessity to doubt the virtue of his wife, but it is characteristic that the husband had not the slightest tendency to count the moons of his absence, and that he stated the broad approximate period of one year without the slightest concern. And the native in question was an intelligent man; he had been a long time with white men, as a "signed-on" boy, and he seemed to be by no means of a timorous or henpecked disposition.

Again, when I once mentioned this matter in the presence of a few white men, resident in the Trobriands, Mr. Cameron, a planter of Kitava, told me a case which had struck him at that time, though he had not the slightest idea of the native ignorance of impregnation. A native of Kitava had been away for two years, signed on to a white man on Woodlark Island. After he came back, he found a baby born a couple of months before his return. He cheerfully accepted it as his own, and did not understand any taunts or allusions made by some white men, who asked him whether he had not better repudiate, or, at least, thoroughly thrash his wife. He found it not in the slightest degree suspicious or suggestive that his wife became pregnant about a year after his departure. These are two striking examples which I find in my notes; but I had before me a considerable amount of corroborating evidence derived from less telling facts, and from imaginary instances, discussed with independent informants.

Finally, the ideas concerning the relationship between father and child, as it is conceived by the natives, bear upon this subject. They have only one generic term for kinship, and this is *veiola*. Now this term means kinship in the maternal line, and does not embrace the relationship between a father and his children, nor between any agnatically related people. Very often, when inquiring into customs and their social basis, I received the answer, "Oh, the father does not do it; because

¹ A white settlement in the east end of New Guinea.

he is not *veiola* to the children." The idea underlying maternal relationship is the community of body. In all social matters (legal, economic, ceremonial) the relationship between brothers is the very closest, "because they are built up of the same body, the same woman gave birth to them." Thus the line of demarcation between paternal or agnatic relationship (which as a generic conception and term does not exist for the natives), and maternal kinship, *veiola*, corresponds to the division between those people who are of the same body (strictly analogous, no doubt, to our consanguinity), and those who are not of the same body.

But in spite of this, as far as all the minute details of daily life are concerned, and further, in various rights and privileges, the father stands in an extremely close relation to the child. Thus the children enjoy membership of the father's village community, though their real village is that of their mother. Again, in questions of inheritance they have various privileges granted them by the father. The most important of these is connected with the inheritance of that most valuable of all goods, magic. Thus very often, especially in such cases as those mentioned above (in Section V), when the father is able to do it legally, he leaves his magic to his son instead of to his brother or nephew. It is remarkable that the father is, sentimentally, always inclined to leave as much as possible to his children, and he does so whenever he can.

Now, such inheritance of magic from father to son shows one peculiarity: it is given, and not sold. Magic has to be handed over during the man's lifetime, of course, as both the formulæ and the practices have to be taught. When the man gives it to any of his *veiola*, to his younger brother, or his maternal nephew, he receives a payment, called in this case *pokala*, and a very considerable payment it has to be. When magic is taught to the son, no payment whatever is levied. This, like many features of native custom, is extremely puzzling, because the maternal relatives have the right to the magic, and the son has really no right whatever, and he may be, under certain circumstances, deprived of the privilege by those entitled to it; yet he receives it free of charge, and they have to pay for it heavily.

Forbearing other explanations, I simply state the native answer to this puzzling question (my informants saw the contradiction quite clearly, and perfectly well understood why I was puzzled). They said: "The man gives it to the children of his wife. He cohabits with her, he possesses her, she does for him all that a wife must do for a man. Whatever he does for a child is a payment (*mapula*) for what he has received from her." And this answer is by no means the opinion of one informant only. It sums up the stereotyped answers given to me whenever I discussed this matter. Thus, in the native mind, the intimate relationship between husband and wife, and not any idea, however slight or remote, of physical fatherhood, is the reason for all that the father does for his children. It must be clearly understood that social and psychological fatherhood (the sum of all the ties, emotional, legal, economic) is the result of the man's obligations towards his wife, and physiological fatherhood does not exist in the mind of the natives.

Let us now proceed to the discussion of the second point in the previously made distinction: the vague ideas about some connection existing between sexual intercourse and pregnancy. I mentioned above, that in the answers given about the cause of pregnancy I was puzzled by the assertion that cohabitation is also the cause of the advent of children, an assertion which ran parallel, so to speak, with the fundamental view that the *baloma*, or reincarnating *waiwaia*, are the real cause.

The said assertion was very much less conspicuous, in fact it was so much overshadowed by the main view, that at first I noticed only the latter, and was persuaded that I had obtained this information quite smoothly and that there were no more difficulties to be cleared up. And when I was quite satisfied that I had finally settled the matter, and inquired into it, prompted merely by the instinct of pure pedantry, I received a severe shock, in finding that there was a flaw in the very foundations of my construction, which latter seemed threatened with complete collapse. I remember being told about a very fickle young lady of Kasanai, known by the name of Iakalusa, "*Sene nakakaita, Coge ivalulu guadi*" (very wanton, she had a child). On enquiring further into this very perplexing sentence, I found that, undoubtedly, a girl of very loose conduct would be more likely to have a child, and that if a girl could be found who had never had intercourse, she certainly could have no child. The knowledge seemed to be as complete here as the ignorance was previously, and the very same men seemed to take, in turn, two contradictory points of view. I discussed the matter as thoroughly as I could, and it seemed to me as if the natives would say *yes* or *no*, according to whether the subject was approached from the side of knowledge or of ignorance. They were puzzled at my persistence, and (I admit with shame) impatience, and I was unable to explain to them my difficulty, though I pointed, as it seemed to me, straight to the contradiction.

I tried to make them compare animals with men, asking whether there is also anything like a *baloma* bringing the small pigs to their mother. I was told of the pigs: "*Ikaitasi ikaitasi makateki bivalulu minana*" ("they copulate, copulate, presently the female will give birth"). Thus here copulation appeared to be the *u'ula* of pregnancy. For a time, the contradictions and obscurities in the information appeared to me quite hopeless; I was in one of the desperate blind alleys, so often encountered in ethnographical field work, when one comes to suspect that the natives are untrustworthy, that they tell tales on purpose; or that one has to do with two sets of information, one of them distorted by white man's influence. As a matter of fact, in this case as in most cases, nothing of the sort was the cause of my difficulties.

The final shock my confidently constructed views about "native ignorance" received brought also order into the chaos. In the mythological cyclis about the hero Tudava, the story opens with his birth. His mother, Mitigis or Bulutukua, was the only woman of all the inhabitants of the village, Laba'i, who remained on the island. All the others fled in fear of an ogre, Dokonikan, who used to eat men, and had in fact almost finished off the whole population of Kiriwina. Bulutukua, left

behind by her brothers, lived alone in a grotto, in the *raiboag* of Laba'i. One day she fell asleep in the grotto, and the water dripping from the stalactites fell on her vulva and opened the passage. After that she became pregnant, and gave birth in succession to a fish, called *bologu*; to a pig; to a shrub, called *kuebila* (having aromatic leaves and much appreciated by the natives as ornament); to another fish (the *kalala*, of which mention has been made above in Section V); to the cockatoo (*katakela*); the parrot (*karaga*); to the bird *sikuaikua*; to a dog (*ka'ukua*); and finally to Tudava. In this story the motive of "artificial impregnation" was most surprising. How was it possible to find, what appeared to be survival of a previous ignorance, among people with whom this ignorance seemed to be still complete? And again, how was it that the woman in the myth had several children in succession, but had been only once under the dripping stalactite? All these were puzzling questions for me, and I put them to the natives on the chance of getting some light, but with little hope of success.

I was, however, rewarded and received a clear and final solution of my difficulties, a solution which has withstood a series of most pedantic subsequent tests. I tried my best informants one after the other, and this is their view of the matter: a woman who is a virgin (*nakapatu*; *na*, female prefix; *kapatu*, closed, shut up) cannot give birth to a child, nor can she conceive, because nothing can enter or come out of her vulva. She must be opened up, or pierced through (*ibasi*, this word is used to describe the action of the water drops on Bulutukua). Thus the vagina of a woman who has much intercourse will be more open and easier for a spirit child to enter. One that keeps fairly virtuous will have much poorer chances of becoming pregnant. But copulation is quite unnecessary except for its mechanical action. In default, any other means of widening the passage may be used, and, if the *baloma* chooses to insert the *waiwaia*, or if one chooses to enter, the woman will become pregnant.

That this is so is proved, beyond any doubt, to my informants by the case of Tilapo'i, a woman living in Kabululo, a village close to Omarakana. She is half blind, almost an idiot, and so plain that no one would think of approaching her sexually. In fact, she is the favourite theme of a certain class of jokes all turning on the assumption of someone having had connection with her: jokes which are always relished and repeated, so that "*Kuoi Tilapo'i!*" ("Have connection with Tilapo'i") has become a form of jocular abuse. In spite, however, of the fact that it is supposed that she never had connection, she once gave birth to child, which died subsequently. A similar example, though even more striking, is afforded by another woman in Sinaketa, who, I was told, is so plain that any man would commit suicide, if he were even seriously suspected of having had anything to do with her sexually. Yet this woman has had no less than five children. In both these cases, it is explained that pregnancy was made possible by dilatation of the vulva, due to digital manipulation. My informants dwelt on this subject with much relish, graphically and diagrammatically explaining to me all the details of the process. Their account did not leave the slightest doubt

about their sincere belief in the possibility of women becoming pregnant without intercourse.

Thus I was taught to make the essential distinction between the idea of the mechanical action of intercourse, which covers all the natives know about the natural conditions of pregnancy, and the knowledge of impregnation, of the man's share in creating the new life in the mother's womb, a fact of which the natives have not even the slightest glimpse. This distinction accounts for the puzzle in the Bulutukua myth, where the woman had to be opened up, but this once done, she could bear the whole set of children successively, without any new physiological incident being necessary. It accounts also for the "knowledge" about animal impregnation. In the case of the animals—and the domestic animals such as the pig and the dog would loom most conspicuously in the native's picture of the universe—the natives know nothing about after-life or spiritual existence. If asked directly, a man might answer "yes" or "no" with regard to the existence of animal *baloma*, but this would be his extemporized opinion and not folklore. Thus, in the case of animals, the whole problem about reincarnation and about the formation of new life is simply ignored. The physiological aspect, on the other hand, is well known. Thus when you ask about the animals, you get the answer that it is necessary that the physiological conditions should exist, but the other side, the real problem of how life is created in the womb, is simply ignored. And it is no good to fret over it, because the native never troubles about consistently carrying over his beliefs into domains where they do not naturally belong. He does not trouble about questions referring to animal after-life, and he has no views about their coming into the world. Those problems are settled with reference to man, but that is their proper domain, and beyond that they ought not to be extended. Even in non-savage theologies such questions (*e.g.*, that of animal soul and animal immortality) are very puzzling, and answers to them often are not much more consistent than those of a Papuan.

In conclusion, it may be repeated that such knowledge as the natives have in this matter has no sociological importance, does not influence the native ideas of kinship, nor their behaviour in matters of sex.

It seems necessary to make a somewhat more general digression on this subject after having dealt with Kiriwinian material. As it is well known, the ignorance of physical fatherhood was first discovered by Sir Baldwin Spencer and Mr. F. Gillen among the Arunta tribe of Central Australia. Subsequently the same state of things was found among a large number of other Australian tribes, by the original discoverers and by some other investigators, the area covered being practically the whole central and north-eastern portion of the Australian continent, as far as it was still open to ethnological investigation.

The main controversial questions raised as to this discovery were: Firstly, is this ignorance a specific feature of the Australian culture, or even the Arunta culture, or is it a universal fact existing among many or all of the lower races? Secondly: is this state of ignorance primitive, is it simply the absence of knowledge,

due to insufficient observation and inference, or is it a secondary phenomenon, due to an obscuring of the primitive knowledge by superimposed animistic ideas?¹

I would not join in this controversy at all, if it were not that I desire to state some additional facts, partly derived from work done outside Kiriwina, partly consisting of some general observations made in the field and bearing directly upon these problems. Therefore, I hope I shall be excused for this digression, on the plea that it is not so much speculation upon controversial points, as additional material bearing upon these questions.

First of all I want to state some non-Kiriwinian observations which seem to show that a state of ignorance similar to that found in the Trobriands obtains among a wide range of the Papuo-Melanesians of New Guinea. Prof. Seligman writes about the Koita: "It is stated that a single sexual act is not sufficient to produce pregnancy, to ensure which cohabitation should be continued steadily for a month."² I have found a similar state of things among the Mailu on the south coast of New Guinea: ". . . The connection between cohabitation and conception seems to be known among the Mailu, but to direct inquiries as to the cause of pregnancy I did not obtain emphatic and positive answers. The natives—of this I am positive—do not clearly grasp the idea of the connection between the two facts . . . Like Prof. Seligman among the Koita, I found the firm belief that it is only continuous intercourse for a month or more that leads to pregnancy, and that one single act is not sufficient to produce the result."³

Neither of these statements is very emphatic, and in fact they do not seem to imply a complete ignorance of physical fatherhood. Yet as neither of the investigators seems to have gone into detail, one may *a priori* suspect that the statements allow of some further qualification. As a matter of fact, I was able to inquire into the matter on my second visit to New Guinea, and I know that my statement about the Mailu is incomplete. At the time of my visit to Mailu I was puzzled in the same manner as in Kiriwina. I had with me in Kiriwina two boys from a district adjacent to that of the Mailu, who gave me exactly the same information as that gathered in Kiriwina, *i.e.*, they affirmed the necessity of sexual intercourse before pregnancy, but were absolutely ignorant as to impregnation. Again looking through my notes taken in the summer of 1914 at Mailu and through some notes taken among the Sinaugholo, a tribe closely allied to the Koita, I see that the native

¹ As I do not want to criticize particular views, so much as to add some data bearing on this problem, I shall not note any statements, especially from those authors whose opinions appear to me to be untenable. The probability of a "non-recognition in early times of the physical relation between father and child" was first suggested by Mr. E. S. Hartland (*The Legend of Perseus*, 1894-96), and the discoveries of Spencer and Gillen brilliantly confirmed his views. Mr. Hartland has subsequently devoted the most exhaustive inquiry extant to this problem (*Primitive Paternity*). Sir J. G. Frazer has also given the support of his illustrious opinion to the view that ignorance of physical fatherhood was universal among early mankind (*Totemism and Exogamy*).

² *The Melanesians of British New Guinea*, p. 84.

³ *Trans. of Roy. Soc. South Australia*, vol. xxxix, 1915, p. 562.

statements really imply only the knowledge of the fact that a woman must have experienced some sexual life before conceiving. And that to all direct questions, whether there is anything in intercourse that induces pregnancy, I received negative answers. Unfortunately, in neither place did I directly inquire whether there are any beliefs about the "supernatural cause of pregnancy." The boys from Gadogado'a (from the district near Mailu) told me there were no such beliefs among them. Their statement cannot, however, be considered final, as they have spent much of their time in white man's service and might not have known much of the traditional knowledge of their tribe. There can be no doubt, however, that both Prof. Seligman's statement and my information obtained in Mailu would, if developed with the help of native informants, yield similar results to the Kiriwinian data with regard to the ignorance of impregnation.

All these natives, the Koita, the Southern Massim of Gadogado'a, and the Northern Massim of Kiriwina¹ are representative of the Papuo-Melanesian stock of natives, the Kiriwinians being a very advanced branch of that stock; in fact, as far as our present knowledge goes, the most advanced.²

The existence of complete ignorance, of the type discovered by Spencer and Gillen, among the most advanced Papuo-Melanesians, and its probable existence among all the Papuo-Melanesians, seems to indicate a much wider range of distribution and a much greater permanence through the higher stages of development than could be assumed hitherto. But it must be emphatically repeated that unless the inquiry be detailed, and especially unless the above-made distinction be observed, there is always the possibility of failure and of erroneous statement.³

¹ I use Professor Seligman's terminology, based on his classification of the Papuans, *op. cit.*, pp. 1-8.

² Cf. Seligman, *op. cit.*, *passim*; also chap. xlix.

³ My own notes taken among the Mailu, and the conclusion I drew from them, are typical of such a failure. As other instances, may be quoted the denial by Strehlow and von Leonhardi of the discoveries of Spencer and Gillen; a denial which, if the argument of von Leonhardi be carefully read, and the data given by Strehlow examined, turns out to be only a futile controversy based upon inadequate premises, and, in fact, completely confirms the original discoveries of Spencer and Gillen. Here the explanation lies in the insufficient mental training of the observer (Strehlow). You can no more expect good all round ethnographical work from an untrained observer than you can expect a good geological statement from a miner, or hydrodynamic theory from a diver. It is not enough to have the facts right in front of one, the faculty to deal with them must be there. But lack of training and mental capacity is not the only cause of failure. In the excellent book about the natives of New Guinea (Goodenough Bay on the N.E. coast), written by the Rev. H. Newton, now Bishop of Carpentaria, than whom none could be better equipped to understand the native mind and to grasp native customs, we read the following statement: "There may be races as ignorant [of the causal relation between connection and pregnancy] as is implied [in Spencer and Gillen's statement]; it is difficult to imagine such, when marital infidelity appears to be so severely punished everywhere, and when the responsibility of the father for the child is recognized, if only to a small extent." (*In Far New Guinea*, p. 194.) Thus, an excellent observer (such as the present Bishop of Carpentaria undoubtedly is), living for years among the natives, knowing their language, has to imagine a state of things which exists fully and completely all round him. And his arguments for denying this state (everywhere, not only among his tribe) is that marital jealousy and recognition of fatherhood both exist (a recognition, which again is not known in

Passing to the second controversial point named above, whether the ignorance in question may not be the secondary result of some obscuring, superimposed, animistic ideas. The general character of the Kiriwinian mental attitude certainly would answer this question with an emphatic negation. The above detailed account, if read from this point of view, is perhaps convincing enough, but some further remarks may add additional weight to the statement. The native mind is absolutely blank on this subject, and it is not as if one found very pronounced ideas about reincarnation running parallel with some obscure knowledge. The ideas and beliefs about reincarnation, though undoubtedly there, are of no eminent social importance, and are not at all to the fore in the native's store of dogmatic ideas. Moreover, the physiological process and the part played by the *baloma* could perfectly well be known to exist side by side, exactly as there exist side by side ideas about the necessity of the mechanical dilatation of the vulva and the action of the spirit ; or as in innumerable matters the native considers the natural and rational (in our sense) sequence of events and knows its causal nexus, though these run parallel with a magical sequence and nexus.

The problem of the ignorance of impregnation is not concerned with the psychology of belief, but with the psychology of knowledge based on observation. Only a belief can be obscured or overshadowed by another belief. Once a physical observation is made, once the natives have got hold of a causal nexus, no belief or "superstition" can obscure this knowledge, though it may run parallel with it. The garden magic does not by any means "obscure" the natives' causal knowledge of the nexus between proper clearing of the scrub, manuring the ground with ashes, watering, etc. The two sets of facts run parallel in his mind, and the one in no way "obscures" the other.

In the ignorance of physiological fatherhood we do not deal with a positive state of mind, with a dogma leading to practices, rites, or customs, but merely with a negative item, the absence of knowledge. Such an absence could not possibly be brought about by a positive belief. Any widespread gap in knowledge, any universal absence of information, any general imperfection in observation found among native races, must, pending contrary evidence, be considered as primitive. We might as well argue that humanity once had a primitive knowledge of wax vestas, but that this was obscured subsequently by the more complex and picturesque use of the fire drill and other friction methods.

the tribe in question, on the physical side)! As if there were the slightest logical nexus between jealousy (a pure instinct) and ideas about conception ; or, again, between these latter and the social ties of the family ! I have taken this statement for criticism, just because it is found in one of the very best ethnographical books which we have about South Sea natives. But I wish to add that my criticism is in a way unfair, because Mr. Newton, as a missionary, could scarcely discuss with the natives all the details of the question, and also because Mr. Newton gives the reader fully to understand that he has not inquired into the question directly, and candidly states the reasons for his doubts. I have quoted the statement, nevertheless, in order to show the many technical difficulties which are connected with the obtaining of accurate information on this subject, and the many gaps through which errors can leak into our knowledge.

Again, to explain this ignorance by assuming that the natives "make belief that they do not know it" seems rather a brilliant *jeu de mots* than a serious attempt to get at the bottom of things. And yet things are as simple as they can be for anyone who for a moment stops to realize the absolutely unsurmountable difficulties which a native "natural philosopher" would have to overcome if he had to arrive at anything approaching our embryological knowledge. If one realizes how complex this knowledge is, and how lately we arrived at it, it would seem preposterous to suppose even the slightest glimmer of it among the natives. All this might appear plausible, even to someone who approached the subject from a merely speculative standpoint, arguing from what probably must be the natives' point of view in this matter. And here we have authors who, after this state of mind has been found positively among natives, receive the news with scepticism, and try to account for the native state of mind in the most devious manner. The way from the absolute ignorance to the exact knowledge is far, and must be passed gradually. There is no doubt that the Kiriwinians have made a step on the way by acknowledging the necessity of sexual intercourse as a preliminary condition of pregnancy, as, indeed, this recognition, though perhaps in a less clear form, has been made by the Arunta in Central Australia, among whom Spencer and Gillen have found the idea that sexual intercourse prepares the woman for the reception of a spirit child.

Another consideration which has been put forward by some authors previously, seems to me to be very much to the point, and, what is more, has seemed so to several of my native informants. I mean the fact that in the majority of savage races sexual life begins very early and is carried on very intensely, so that sexual intercourse is for them not an outstanding rare fact, which would strike them from its singularity, and therefore compel them to look for consequences; on the contrary, sexual life is for them a normal state. In Kiriwina the unmarried girls from six (*sic*) upwards are generally supposed to practise license well-nigh every night. It is immaterial whether this is so or not; it matters only that for the native of Kiriwina sexual intercourse is almost as common an occurrence as eating, drinking, or sleeping. What is there to guide the native observation, to draw his attention to the nexus between a perfectly normal, everyday occurrence, on the one hand, and an exceptional, singular event on the other? How is he to realize that the very act which a woman performs almost as often as eating or drinking will, once, twice or three times in her life, cause her to become pregnant?

It is certain that only two outstanding, singular events easily reveal a nexus. To find out that something extraordinary is the result of an entirely ordinary event requires, besides a scientific mind and method, the power of investigating, of isolating facts, of excluding the non-essential, and experimenting with circumstances. Given such conditions, the natives would probably have discovered the causal connection, because the native mind works according to the same rules as ours: his powers of observation are keen, whenever he is interested, and the

concept of cause and effect is not unknown to him.¹ But although cause and effect in the developed form of these conceptions are of the category of the regular, lawful, and ordinary, in their psychological origin they are undoubtedly of the category of the lawless, irregular, extraordinary, and singular.

Some of my native informants very clearly pointed out to me the lack of consistency in my argument when I bluntly stated that it is not the *baloma* that produce pregnancy, but that it is caused by something like a seed being thrown on soil. I remember that I was almost directly challenged to account for the discrepancy why the cause which was repeated daily, or almost so, produced effects so rarely.

To sum up, there seems to be no doubt that if we are at all justified in speaking of certain "primitive" conditions of mind, the ignorance in question is such a primitive condition, and its prevalence among the Melanesians of New Guinea seems to indicate that it is a condition lasting right into much higher stages of development than it would have seemed possible to assume on the basis of Australian material only. Some knowledge of the mental mechanism of the native, and of the circumstances under which he has to carry out his observations on this subject, ought to persuade anyone that no other state of things could exist, and that no far-fetched explanations or theories are necessary to account for it.

VIII.

Besides the concrete data about native beliefs which have been given above, there is another set of facts of no less importance which must be discussed before the present subject can be considered exhausted. I mean the general sociological laws that have to be grasped and framed in the field, in order that the material, which observation brings in a chaotic and unintelligible form, may be understood by the observer and recorded in a scientifically useful form. I have found the lack of philosophical clearness on matters connected with ethnographical and sociological field work a great set-back in my first attempts to observe and describe native institutions, and I consider it quite essential to state the difficulties I encountered in my work and the manner in which I tried to cope with them.

Thus one of the main rules with which I set out on my field work was "to gather pure facts, to keep the facts and interpretations apart." This rule is quite correct if under "interpretations" be understood all hypothetical speculations about origins, etc., and all hasty generalizations. But there is a form of interpretation of facts without which no scientific observation can possibly be carried on—I mean the interpretation which sees in the endless diversity of facts general laws; which severs the essential from the irrelevant; which classifies and orders phenomena, and puts them into mutual relationship. Without such interpretation all scientific

¹ My experience in the field has persuaded me of the complete futility of the theories which attribute to the savage a different type of mind and different logical faculties. The native is not "prelogical" in his beliefs, he is alogical, for belief or dogmatic thinking does not obey the law of logic among savages any more than among ourselves.

work in the field must degenerate into pure "collectioneering" of data; at its best it may give odds and ends without inner connection. But it never will be able to lay bare the sociological structure of a people, or to give an organic account of their beliefs, or to render the picture of the world from the native perspective. The often fragmentary, incoherent, non-organic nature of much of the present ethnological material is due to the cult of "pure fact." As if it were possible to wrap up in a blanket a certain number of "facts as you find them" and bring them all back for the home student to generalize upon and to build up his theoretical constructions upon.

But the fact is that such a proceeding is quite impossible. Even if you spoil a district of all its material objects, and bring them home without much bothering about a careful description of their use—a method which has been carried out systematically in certain non-British possessions in the Pacific—such a museum collection will have little scientific value, simply because the ordering, the classifying, and interpreting should be done in the field with reference to the organic whole of native social life. What is impossible with the most "crystallized" phenomena—the material objects—is still less possible with those which float on the surface of native behaviour, or lie in the depths of the native mind, or are only partially consolidated into native institutions and ceremonies. In the field one has to face a chaos of facts, some of which are so small that they seem insignificant; others loom so large that they are hard to encompass with one synthetic glance. But in this crude form they are not scientific facts at all; they are absolutely elusive, and can be fixed only by interpretation, by seeing them *sub specie aeternitatis*, by grasping what is essential in them and fixing this. *Only laws and generalizations are scientific facts*, and field work consists only and exclusively in the interpretation of the chaotic social reality, in subordinating it to general rules.

All statistics, every plan of a village or of grounds, every genealogy, every description of a ceremony—in fact, every ethnological document—is in itself a generalization, at times quite a difficult one, because in every case one has first to discover and formulate the rules: what to count and how to count; every plan must be drawn to express certain economic or sociological arrangements; every genealogy has to express kinship connections between people, and it is only valuable if all the relevant data about the people are collected as well. In every ceremony the accidental has to be sifted from the essential, the minor elements from the essential features, those that vary with every performance from those that are customary. All this may appear almost a truism, yet the unfortunate stress on keeping to "pure fact only" is constantly being used as the guiding principle in all instructions for field work.

Returning from this digression to the main subject, I want to adduce some general sociological rules which I had to formulate in order to deal with certain difficulties and discrepancies in the information, and in order to do justice to the complexity of facts, at the same time simplifying them in order to present a clear outline. What will be said in this place applies to Kiriwina, but not necessarily

to any other or wider area. And, again, only those sociological generalizations will be discussed here which bear directly on belief, or even, more specially, on the beliefs described in this article.

The most important general principle concerning belief that I have been forced to respect and consider in the course of my field studies is this: Any belief or any item of folklore is not a simple piece of information to be picked up from any haphazard source, from any chance informant, and to be laid down as an axiom to be drawn with one single contour. On the contrary, every belief is reflected in all the minds of a given society, and it is expressed in many social phenomena. It is therefore complex, and, in fact, it is present in the social reality in overwhelming variety, very often puzzling, chaotic and elusive. In other words, there is a "social dimension" to a belief, and this must be carefully studied; the belief must be studied as it moves along this social dimension; it must be examined in the light of diverse types of mind and of the diverse institutions in which it can be traced. To ignore this social dimension, to pass over the variety in which any given item of folklore is found in a social group, is unscientific. It is equally unscientific to acknowledge this difficulty and to solve it by simply assuming the variations as non-essential, because that only is non-essential in science which cannot be formulated into general laws.

The manner in which ethnological information about beliefs is usually formulated is somewhat like this: "The natives believe in the existence of seven souls"; or else, "In this tribe we find that the evil spirit kills people in the bush," etc. Yet such statements are undoubtedly false, or at the best incomplete, because no "natives" (in the plural) have ever any belief or any idea; each one has his own ideas and his own beliefs. Moreover, the beliefs and ideas exist not only in the conscious and formulated opinions of the members of a community. They are embodied in social institutions and expressed by native behaviour, from both of which they must be, so to speak, extricated. At any rate, it appears clearly that the matter is not as simple as the ethnological usage of "one-dimensional" accounts would imply. The ethnographer gets hold of an informant, and from conversation with him is able to formulate the native's opinion, say, about after-life. This opinion is written down, the grammatical subject of the sentence put into the plural, and we learn about the "natives believing so-and-so." This is what I call a "one-dimensional" account, as it ignores the social dimensions, along which belief must be studied, just as it ignores its essential complexity and multiplicity.¹

¹ To test this sociological principle on civilized instances; when we say that the "Roman Catholics believe in the infallibility of the Pope," we are correct only in so far as we mean that this is the orthodox belief, enjoined on all members of that church. The Roman Catholic Polish peasant knows as much about this dogma as about the Infinitesimal Calculus. And if it were proposed to study the Christian religion, not as a doctrine, but as a sociological reality (a study which, as far as I am aware, has never yet been attempted), all the remarks in this paragraph would apply, *mutatis mutandis*, to any civilized community with the same strength as to the "savages" of Kiriwina.

Of course, very often, though by no means always, this multiplicity may be ignored, and the variations in detail overlooked as unessential, in view of the uniformity which obtains in all essential and main features of a belief. But the matter must be studied, and methodical rules applied to the simplification of the variety, and unification of the multiplicity of facts. Any haphazard proceeding must, obviously, be discarded as unscientific. Yet, as far as I am aware, no attempt has been made by any inquirer in the field, even the most illustrious, to discover and lay down such methodical rules. The following remarks ought, therefore, to be treated indulgently, being only an unaided attempt to suggest certain important connections. They deserve indulgence also on account of being the result of actual experiences and difficulties encountered in the field. If, in the account of beliefs given above, there is a certain lack of uniformity and smoothness; if, further, the observer's own difficulties are somewhat brought into relief, this must be excused on the same account. I attempted to show as plainly as possible the "social dimension" in the domain of belief, not to conceal the difficulties which result from the variety of native opinions, and also from the necessity of constantly holding in view both social institutions and native interpretation, as well as the behaviour of the natives; of checking social fact by psychological data, and *vice versa*.

Now let us proceed to lay down the rules which allow us to reduce the multiplicity of the manifestations of a belief to simpler data. Let us start with the statement made several times, namely, that the crude data present almost a chaos of diversity and multiplicity. Examples may be easily found among the material presented in this article, and they will allow the argument to be clear and concrete. Thus, let us take the beliefs corresponding to the question, "How do the natives imagine the return of the *baloma*?" I have actually put this question, adequately formulated, to a series of informants. The answers were, in the first place, always fragmentary—a native will just tell you one aspect, very often an irrelevant one, according to what your question has suggested in his mind at the moment. Nor would an untrained "civilized man" do anything else. Besides being fragmentary, which could be partially remedied by repeating the question and using each informant to fill up the gaps, the answers were at times hopelessly inadequate and contradictory. Inadequate because some informants were unable to grasp the question even, at any rate unable to describe such a complex fact as their own mental attitude, though others were astonishingly clever, and almost able to understand what the ethnological inquirer was driving at.

What was I to do? To concoct a kind of "average" opinion? The degree of arbitrariness seemed much too great. Moreover, it was obvious that the opinions were only a small part of the information available. All the people, even those who were unable to state what they thought about the returning *baloma* and how they felt towards them, none the less behaved in a certain manner towards those *baloma*, conforming to certain customary rules and obeying certain canons of emotional reaction.

Thus, in searching for an answer to the above question—or to any other question of belief and behaviour—I was moved to look for the answer in the corresponding customs. The distinction between private opinion, information gathered by asking the informants, and public ceremonial practices, had to be laid down as a first principle. As the reader will remember, a number of dogmatic tenets have been enumerated above, which I have found expressed in customary traditional acts. Thus the general belief that the *baloma* return is embodied in the broad fact of the *milamala* itself. Again, the display of valuables (*ioiova*), the erection of special platforms (*tokaikaya*), the display of food on the *lalagua*—all this expresses the presence of the *baloma* in the village, the efforts to please them, to do something for them. The food presents (*silakuturu* and *bubualu'a*) show an even more intimate participation in village life by the *baloma*.

The dreams, which often preceded such offerings, are also customary features, just because they are associated with, and sanctioned by, such customary offerings. They make the communion between the *baloma* and the living, in a way, personal, and certainly more distinct. The reader will be able easily to multiply these examples (connection between belief in Topileta and his fee, and the valuables laid round the body before burial; beliefs embodied in the *ioba*, etc.).

Besides the beliefs expressed in the traditional ceremonies, there are those embodied in magical formulæ. These formulæ are as definitely fixed by tradition as the customs. If anything, they are more precise as documents than the customs can be, since they do not allow of any variations. Only small fragments of magical formulæ have been given above, yet even these serve to exemplify the fact that beliefs can be unmistakably expressed by spells, in which they are embedded. Any formula accompanied by a rite expresses certain concrete, detailed, particular beliefs. Thus, when, in one of the above-named garden rites, the magician puts a tuber on the stone in order to promote the growth of the crops, and the formula which he recites comments on this action and describes it, there are certain beliefs unmistakably documented by it: the belief in the sacredness of the particular grove (here our information is corroborated by the taboos surrounding that grove); the belief in the connection between the tuber put on the sacred stone and the tubers in the garden, etc. There are other, more general, beliefs embodied and expressed in some of the above-mentioned formulæ. Thus the general belief in the assistance of ancestral *baloma* is standardized, so to speak, by the spells by which those *boloma* are invoked, and the accompanying rites in which they receive their *ula'ula*.

As mentioned above, some magical spells are based upon certain myths, details of which appear in the formulæ. Such myths, and myth in general, must be put side by side with the magical spells as traditional, fixed expressions of belief. As an empirical definition of a myth (again only claiming a validity for the Kiriwinian material) the following criteria can be accepted: it is a tradition explaining essential sociological features (*e.g.*, myths about the division in clans and subclans), referring to persons who performed notable feats, and whose past existence is

implicitly believed in. Traces of such existence in various memorial spots are still shown: a dog petrified, some food transformed into stone, a grotto with bones, where the ogre Dokonikan lived, etc. The reality of mythical persons and mythical occurrences stands in vivid contrast to the unreality of ordinary fables, many of which are told.

All beliefs embodied in mythological tradition can be assumed to be almost as invariable as those embodied in magical formulæ. In fact, the mythical tradition is extremely well fixed, and accounts given by natives of different places in Kiriwina—natives of Luba and natives of Sinaketa—agreed in all details. Moreover, I obtained an account of certain myths of the Tudava cycle during a short visit to Woodlark Island, which lies some 60 miles to the east of the Trobriands but belongs to the same ethnological group, called by Prof. Seligman the Northern Massim, which agrees in all essential features with the facts obtained in Kiriwina.

Summing up all these considerations, we may say that all beliefs as implied in native customs and tradition must be treated as invariably fixed items. They are believed and acted upon by all, and, as customary actions do not allow of any individual varieties, this class of belief is standardized by its social embodiments. They may be called the dogmas of native belief, or the social ideas of a community, as opposed to individual ideas.¹ One important addition has to be made, however, to complete this statement: only such items of belief can be considered as "social ideas" as are not only embodied in native institutions, but are also explicitly formulated by the natives and acknowledged to exist therein. Thus all the natives will acknowledge the presence of the *baloma* during the *milamala*, their expulsion at the *ioba*, etc. And all the competent ones will give unanimous answers in the interpretation of magical rites, etc. On the other hand, the observer can never safely venture to read his own interpretations into the native customs. Thus, for instance, in the above-mentioned fact, that mourning is always finally discarded immediately after an *ioba*, there seems to be unmistakably expressed the belief that the person waits till the *baloma* of the deceased has gone before giving up the

¹ I am purposely not using the term "collective ideas," introduced by Professor Durkheim and his school, to denote a conception, which in their hands, more especially in the writings of Hubert and Mauss, has proved extremely fertile. In the first place, I am not able to judge whether the above analysis would really cover what that school denotes by "collective ideas." Remarkably enough, there does not seem to be anywhere a clear, candid statement of what they mean by "collective idea," nothing approaching a definition. It is obvious that in this discussion, and in general, I am under a great obligation to these writers. But I am afraid that I am entirely out of touch with Professor Durkheim's philosophical basis of sociology. It seems to me that this philosophy involves the metaphysical postulate of a "collective soul," which, for me, is untenable. Moreover, whatever discussion might be carried on as to the theoretical value of the conception of a "collective soul," in all practical sociological investigations one would be left hopelessly in the lurch by it. In the field, when studying a native or civilized community, one has to do with the whole aggregate of individual souls, and the methods and theoretical conceptions have to be framed exclusively with this multiplex material in view. The postulate of a collective consciousness is barren and absolutely useless for an ethnographical observer.

mourning. But the natives do not endorse this interpretation, and therefore it cannot possibly be considered as a social idea, as a standardized belief. The question whether this belief was not originally the reason for the practice belongs to quite a different class of problem, but it is obvious that the two cases must not be confounded; one, where a belief is formulated in a society universally, besides being embodied in institutions; the other, where the belief is ignored, though apparently expressed in an institution.

This allows us to formulate a definition of a "social idea": *It is a tenet of belief embodied in institutions or traditional texts, and formulated by the unanimous opinion of all competent informants.* The word "competent" simply excludes small children and hopelessly unintelligent individuals. Such social ideas can be treated as the "invariants" of native belief.

Besides the social institutions and traditions, both of which embody and standardize belief, there is another important factor, which stands in a somewhat similar relation to belief—I mean the general behaviour of the natives towards the object of a belief. Such behaviour has been described above as illuminating important aspects of native belief about the *baloma*, the *kosi*, the *mulukuausi*, and as expressing the natives' emotional attitude towards them. This aspect of the question is beyond doubt of extreme importance. To describe the ideas of the natives concerning a ghost or spirit is absolutely insufficient. Such objects of belief arouse pronounced emotional reactions, and one ought to look, in the first place, for the objective facts corresponding to these emotional reactions. The above data concerning this aspect of native belief, insufficient as they are, show clearly that with more experience in method a systematic inquiry could be carried out into the emotional side of belief on lines as strict as ethnological observations admit.

The behaviour can be described by putting the natives to certain tests concerning their fear of ghosts, or their respect for spirits, etc. I have to admit that, though realizing the importance of the subject, I did not quite see, whilst in the field, the proper manner to deal with this difficult and new subject. But I now clearly see that, had I been better on the look out for relevant data in this line, I should have been able to present much more convincing and objectively valid data. Thus in the problem of fear my tests were not sufficiently elaborate, and even as they were made, not sufficiently minutely recorded in my notes. Again, though I well remember the tone in which I heard them speaking—rather irreverently—about the *baloma*, I also remember that a few characteristic expressions struck me at the time, which I ought to have noted at once, and did not. Again, watching the behaviour of the performers and spectators in a magical ceremony, certain small facts characterizing the general "tone" of the natives' attitude are to be found. Such facts I have observed partly, though, I think, insufficiently (they were only just mentioned in this article when speaking about the *kamkokola* ceremony, as they really do not bear on the subject of spirits or after-life). The fact is, however, that until this aspect is more generally taken under observation and some com-

parative material exists, the full development of the method of observation is very difficult.

The emotional attitude expressed in behaviour, and characterizing a belief, is not an invariable element: it varies with individuals, and it has no objective "seat" (such as the beliefs embodied in institutions have). Nevertheless, it is expressed by objective facts, which can be almost quantitatively stated, as in measuring the amount of inducement needed and the length of an expedition on which a native will venture alone under fear-inspiring conditions. Now, in each society there are braver and more cowardly individuals, emotional people and callous ones, etc. But divers types of behaviour are characteristic for different societies, and it seems enough to state the type, since the variations are well-nigh the same in all societies. Of course, if it be possible to state the variations, so much the better.

To illustrate the matter concretely, by the simplest example, that of fear, I have experimented with this element in another district in Papua—in Mailu, on the south coast—and found that no normal inducement, no offering of even an excessive payment in tobacco, would prevail upon any native to cover at night and alone any distance out of sight and earshot of the village. Even here, however, there were variations, some men and boys being unwilling to run the risk even at dusk, others being ready to go out at night to some inconsiderable distance for a payment of a stick of tobacco. In Kiriwina, as described above, the type of behaviour is absolutely different. But here again some people are much more timorous than others. Perhaps these variations could be expressed more exactly, but I am not in the position to do it, and at any rate the type of behaviour characterizes the corresponding beliefs, when compared with the Mailu type, for instance.

It seems feasible, therefore, as the first approach to exactness, to treat elements of belief expressed by behaviour as types; that is, not to trouble about the individual variation. In fact, the types of behaviour seem to vary considerably with the society, whereas the individual differences seem to cover the same range. This does not mean that they ought to be ignored, but that, in the first approach, they may be ignored without making the information incorrect through incompleteness.

Let us pass now to the last class of material which must be studied in order to grasp the beliefs of a certain community—the individual opinions or interpretations of facts. These cannot be considered as invariable, nor are they sufficiently described by indicating their "type." Behaviour, referring to the emotional aspect of belief, can be described by showing its type, because the variations move within certain well-described limits, the emotional and instinctive nature of man being, as far as one can judge, very uniform, and the individual variations remaining practically the same in any human society. In the domain of the purely intellectual aspect of belief, in the ideas and opinions explaining belief, there is room for the greatest range of variations. Belief, of course, does not obey the laws of logic, and the contradictions, divergencies, and all the general chaos pertaining to belief must be acknowledged as a fundamental fact.

One important simplification in this chaos is obtained by referring the variety of individual opinions to the social structure. In almost every domain of belief there is a class of men whose social position entitles them to a special knowledge of the beliefs in question. In a given community they are generally and officially considered to be the possessors of the orthodox version, and their opinion is considered the correct one. Their opinion, moreover, is to a considerable extent based on a traditional view which they have received from their ancestors.

This state of things is, in Kiriwina, very well exemplified in the tradition of magic and of the connected myths. Although there is as little esoteric lore and tradition, and as little taboo and secrecy, as in any native society which I know from experience or literature, nevertheless there is complete respect for a man's right to his own domain. If you ask in any village any question referring to more detailed magical proceedings in the gardening department, your interlocutor will immediately refer you to the *towosi* (garden magician). And then on further inquiry you learn, as often as not, that your first informant knew all the facts absolutely well and was perhaps able to explain them better than the specialist himself. None the less, native etiquette, and the feeling of what is right, compelled him to refer you to the "proper person." If this proper person be present, you will not be able to induce anyone else to talk on the matter, even if you announce that you do not want to hear the specialist's opinion. And, again, I have several times obtained information from one of my usual instructors and subsequently the "specialist" has told me that it is not correct. When, later, I referred this correction to my original informant, he would, as a rule, withdraw his opinion saying, "Well, if he says so, it must be correct." Special caution ought of course to be exercised when the specialist is naturally inclined to lie, as is often the case with the sorcerers (those who possess the power to kill people by magic).

Again, if the magic and corresponding tradition belong to another village, the same discretion and reserve is observed. You are advised to go to that village for information. When pressed, your native friends may perhaps tell you what they know about the matter, but they will always wind up the report by saying: "You must go there and gather the right knowledge at the right source." In the case of magic formulæ, this is absolutely necessary. Thus I had to go to Laba'i in order to get the *kalala*-fishing magic, and to Kuaibola to record the shark-fishing charms. I obtained the canoe-building magic from men of Lu'ebila, and I went to Buaitalu to get the tradition and spell of the *toginivaiu*, the most powerful form of sorcery, though I was unable to procure the *silami* or evil spell and was only partially successful in getting the *vivisa* or healing spell. Even if the knowledge to be obtained is not spells, but mere traditional lore, one is often sorely disappointed. Thus, for instance, the proper seat of the Tudava myth is Laba'i. Before I went there I had gathered all that my informants in Omarakana could tell me and expected to reap an enormous harvest of additional information, but as a matter of fact, it was I who impressed the natives of Laba'i, by quoting details which were hailed by them as quite true, but which had escaped their memory.

In fact, no one there was half as good on the Tudava cyclus as my friend Bagido'u of Omarakana. Again, the village of Ialaka is the historic spot where once a tree was erected up to heaven. And this was the origin of thunder. If you ask about the nature of thunder, everybody will tell you straight off: "Go to Ialaka and ask the *tolivalu* (the headman)," although practically everybody is able to tell you all about the origin and nature of thunder, and your pilgrimage to Ialaka, if you undertake it, will prove a great disappointment.

Nevertheless, these facts show that the idea of specialization in traditional lore is strongly developed; that in many items of belief, and in many opinions about belief, the natives recognize a class of specialist. Some of these are associated with a certain locality; in such cases it is always the headman of the village who represents the orthodox doctrine, or else the most intelligent of his *veiola* (maternal kinsmen). In other cases the specialization goes within the village community. In this place we are not concerned with this specialization, in so far as it determines the right to obtain magical formulæ, or the correct reciting of certain myths, but only in so far as it refers to the interpretation of all beliefs connected with such formulæ or myths. Because, besides the traditional text, the "specialists" are always in possession of the traditional interpretations or commentaries. It is characteristic that, when talking with such specialists, you always get clearer answers and opinions. You clearly see that the man does not speculate or give you his own views, but that he is fully aware of being asked about the orthodox view, about the traditional interpretation. Thus when I asked certain informants about the meaning of the "*si buala baloma*," the miniature hut made of dry twigs during one of the garden rites (see above, V), they tried to give me a kind of explanation, which, I saw at once, was their own private view of the matter. When I asked Bagido'u, the *towosi* (garden magician) himself, he simply waived away all explanations and said, "This is merely an old traditional thing, no one knows its meaning."

Thus in the diversity of opinions there is one important line of demarcation to be drawn: that between the opinions of competent specialists and the views of the profane public. The opinions of the specialists have a traditional basis: they are clearly and categorically formulated and, in the eyes of the native, they represent the orthodox version of the belief. And, since on each subject there is a small group of people, in the last instance one man, to be considered, it is easy to see that the most important interpretation of belief does not present any great difficulties in handling.

But in the first place, this most important interpretation does not represent all the views, it cannot be taken even as typical, at times. Thus for instance, in sorcery (evil, homicidal magic), it is of absolute importance to distinguish between the views of the specialist and those of the outsider, because both represent equally important and naturally different aspects of the same problem. Again, there are certain classes of belief where one would in vain look for departmental specialists. Thus about the nature of the *baloma* and their relation to the *kosi*, there were some

statements more trustworthy and detailed than others, but there was no one who would be a naturally and generally acknowledged authority.

In all matters where there are no specialists, and again in matters in which the opinion of non-specialists is of intrinsic interest, it is necessary to have certain rules for fixing the fluctuating opinion of the community. Here I see only one clear and important distinction: namely, between what can be called public opinion, or more correctly—since public opinion has a specific meaning—the general opinion of a given community on the one hand, and the private speculations of individuals on the other. This distinction is, as far as I can see, sufficient.

If you examine the "broad masses" of the community, the women and children included (a proceeding which is easy enough when you speak the language well and have lived for months in the same village, but which otherwise is impossible), you will find that, whenever they grasp your questions, their answers will not vary: they will never venture into private speculations. I have had most valuable information on several points from boys and even girls of seven to twelve years of age. Very often, on my long afternoon walks, I was accompanied by the children of the village and then, without the constraint of being obliged to sit and be attentive, they would talk and explain things with a surprising lucidity and knowledge of tribal matters. In fact, I was often able to unravel sociological difficulties with the help of children, which old men could not explain to me. The mental volubility, lack of the slightest suspicion and sophistication, and, possibly, a certain amount of training received in the Mission School, made of them incomparable informants in many matters. As to the danger of their views being modified by missionary teaching, well, I can only say that I was amazed at the absolute impermeability of the native mind to those things. The very small amount of our creed and ideas they acquire remains in a watertight compartment of their mind. Thus the general tribal opinion in which practically no variety is to be found can be ascertained even from the humblest informants.

When dealing with intelligent grown-up informants, things are quite different. And as they are the class with whom an ethnographer has to do most of his work, the variety of their opinion comes very much to the fore, unless the inquirer is satisfied in taking one version of each subject and sticking to it through thick and thin. Such opinions of intelligent, mentally enterprising informants, as far as I can see, cannot be reduced or simplified according to any principles: they are important documents, illustrating the mental faculties of a community. Further on, they very often represent certain typical ways of conceiving a belief, or of solving a difficulty. But it must be clearly borne in mind that such opinions are sociologically quite different from what we called above dogmas or social ideas. They are also different from generally accepted or popular ideas. They form a class of interpretation of belief, which closely corresponds to our free speculation on belief. They are characterized by their variety, by not being expressed in customary or traditional formulæ, by being neither the orthodox expert opinion, nor the popular view.

These theoretical considerations about the sociology of belief may be summarized in the following table, in which the various groups of belief are classified in a manner which seems to express their natural affinities and distinctions, as far, at least, as the Kiriwinian material requires:—

1. *Social ideas or dogmas.*—Beliefs embodied in institutions, in customs, in magico-religious formulæ and rites and in myths. Essentially connected with and characterized by emotional elements, expressed in behaviour.
2. *Theology or interpretation of the dogmas.*—
 - (a) Orthodox explanations, consisting of opinions of specialists.
 - (b) Popular, general views, formulated by the majority of the members of a community.
 - (c) Individual speculations.

Examples for each group can be easily found in this article, where the degree and quality of social depth, the “social dimension” of every item of belief, has been given, at least approximately. It must be remembered that this theoretical scheme, though dimly recognized at the beginning, has been only imperfectly applied, because the technique of its applicability in field work had to be elaborated bit by bit, through actual experience. It is, therefore, with reference to my Kiriwinian material, rather a conclusion *ex post facto* than a basis of method adopted at the outset and systematically carried out throughout the work.

Examples of dogma or social ideas are to be found in all the beliefs, which have been described as embodied in the customs of the *milamala* and in the magical rites and formulæ. Also in corresponding myths, as well as in the mythological tradition, referring to after-life. The emotional aspect has been treated, as far as my knowledge allows, in describing the behaviour of the natives towards magical performances during the *milamala*, their behaviour towards the *baloma*, the *kosi*, and the *mulukuwasi*.

Of the theological views, several orthodox interpretations have been given in the explanations by a magician of his magic. As popular views (barring such as are dogmas at the same time) I may note the belief concerning spiritism: everybody, even the children, knew well that certain people went to Tuma and brought back songs and messages to the living. This, however, was in no way a dogma, since it was even open to scepticism on the part of some exceptionally sophisticated informants, and since it was connected with no customary institution.

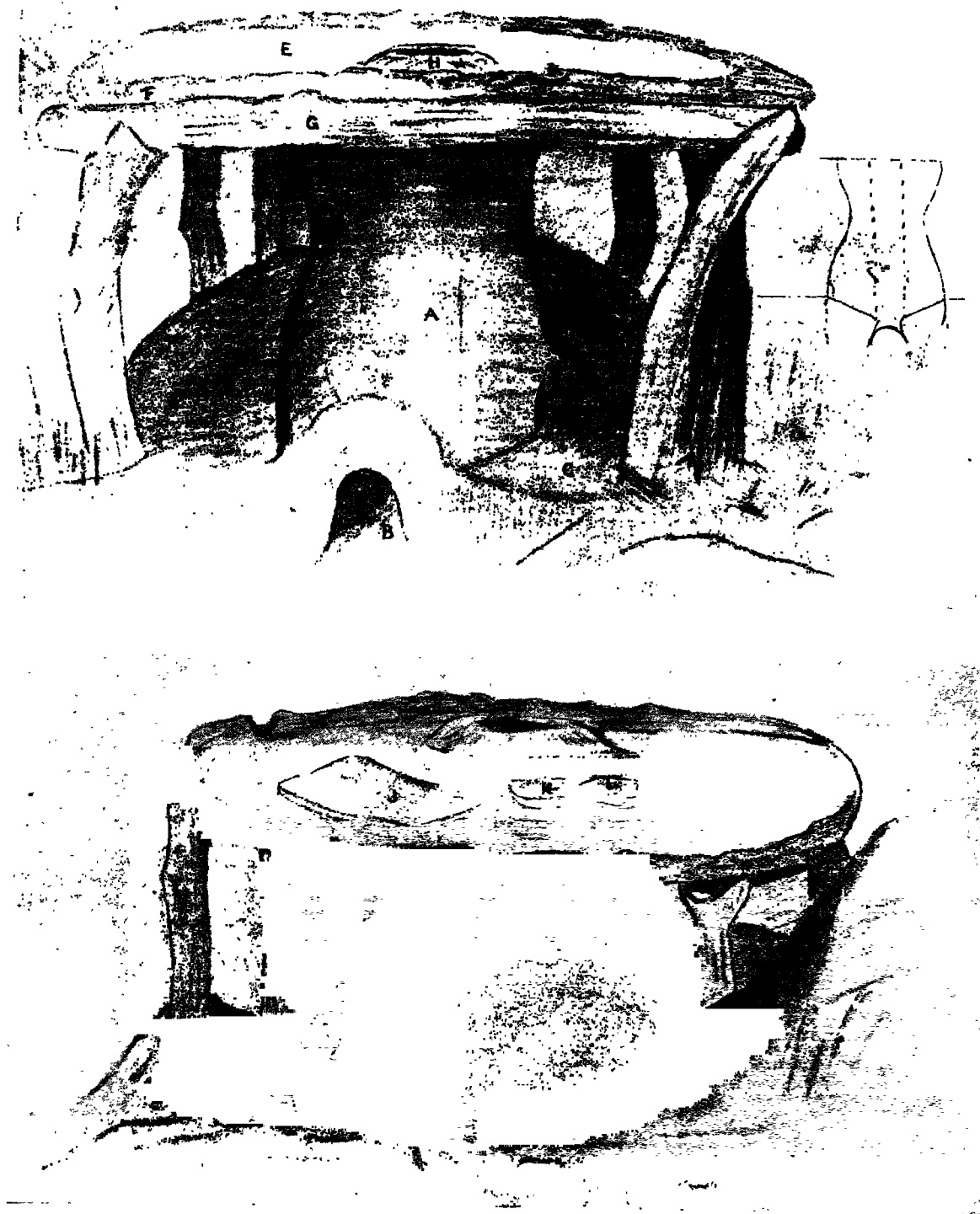
The speculations about the nature of the *baloma* are the best example illustrating the purely individual class of theology, consisting of private opinions.

I wish to remind the reader that local differences, that is the variation of belief according to district, have not been considered at all in this theoretical section. Such differences belong to the domain of anthropogeography rather than sociology. Moreover, they affect only to a very small extent the data presented in this paper, as practically all of my material has been collected within a small

district, where local variations hardly exist at all. Only as regards the reincarnation, local differences may account for some divergencies in belief (see above, VI).

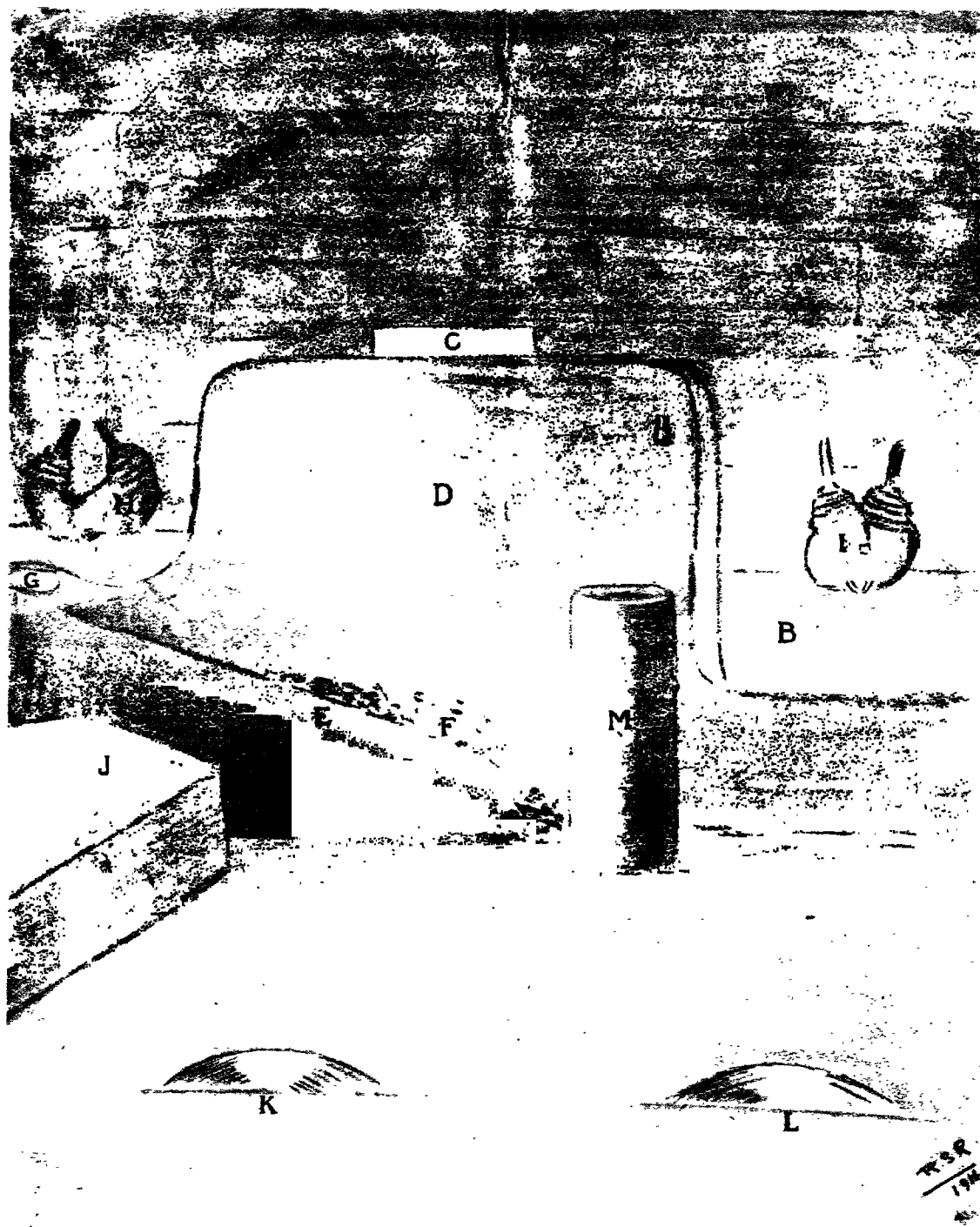
From such district variations the above-mentioned localized specialization in certain departments (thunder in Ialaka, shark in Kuaibuola, etc.) must be carefully distinguished, because this is a factor connected with the structure of society and not merely an example of the broad anthropological fact, that everything changes as we move over the surface of the earth.

All these theoretical remarks, it is plain, are the outcome of experience in the field, and it was considered well to print them here in connection with the data already given, because they are also ethnological facts, only of a much more general nature. This, however, makes them, if anything, more important than the details of custom and belief. Only the two aspects, the general law and the detailed documentation, make information really complete, as far as it goes.



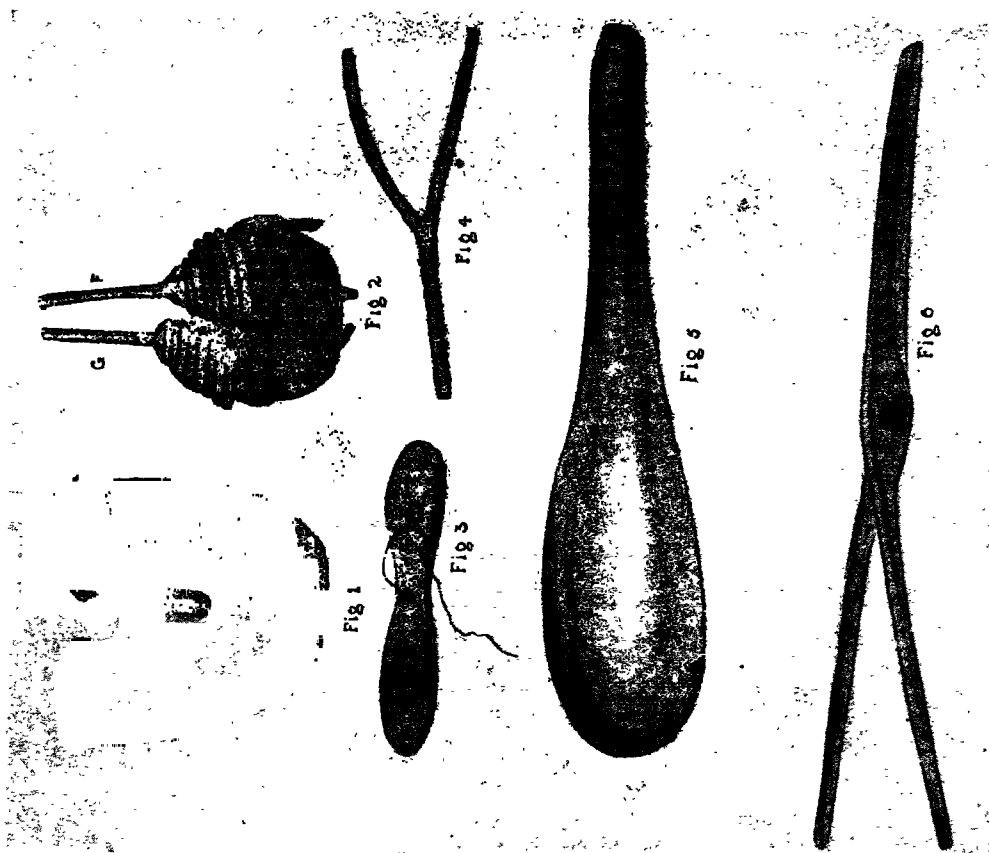
1 AND 2.—VIEWS OF THE SMELTING FURNACE. (FROM SKETCHES.)

THE IRON WORKERS OF AKPAFU.



THE FORGE AND WORKSHOP. (FROM A SKETCH.)

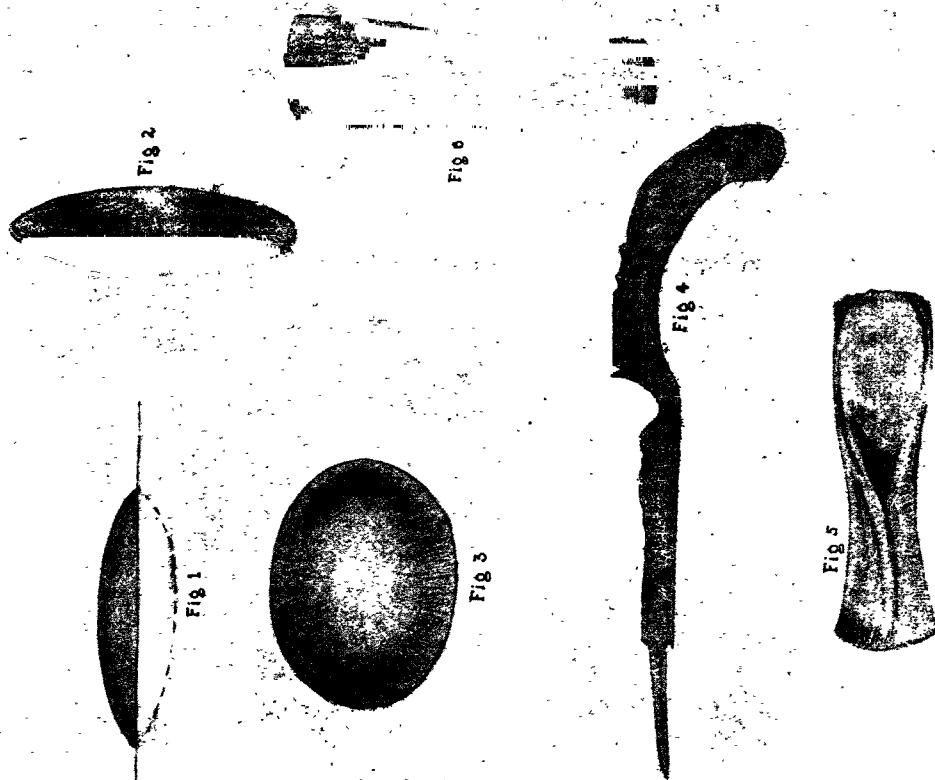
THE IRON WORKERS OF AKPAFU.



I.—SMITH'S TOOLS.

THE IRON WORKERS OF AKPAFU.

II.—SMITH'S TOOLS.





1.—SMELTING FURNACE. (FRONT VIEW, FROM A PHOTOGRAPH.)



2.—SMELTING FURNACE. (SIDE VIEW, FROM A PHOTOGRAPH.)

THE IRON WORKERS OF AKPAFU.

THE IRON WORKERS OF AKPAFU.

[WITH PLATES XXI-XXIV.]

By R. S. RATTRAY, F.R.G.S., Dip. Anth., Oxford.

AMONG the mountains in the south-western corner of the late German colony of Togoland, situated about 7 degrees north, are to be found the remains of an industry bearing the stamp of extreme antiquity.

In view of the oft-repeated supposition that the secret of smelting iron was first discovered in the Dark Continent, whence it was introduced into Europe, a description of the *modus operandi* once employed here in the mining, smelting, and working of the ore must be of considerable interest. German thoroughness in scientific research is not likely to have overlooked this metaphorical and literal mine of anthropological interest, but the writer has not been able to trace any records or description of it among the papers in connection with his district, nor is he aware if any such description has been published in European scientific journals.

The following account is necessarily somewhat superficial, and not by any means exhaustive. The time at the writer's disposal was brief, and these researches were sandwiched in at the end of long days of tramping over hills and valleys in the thankless task of demarcating a long and bitterly contested boundary. Land disputes are the bugbear of all officials in these parts, where real property is generally no man's land till some native, more astute than his neighbour, sees in the mountains and valleys potential agricultural wealth, and straightway produces his title deeds, generally in the form of a tradition that would strive to prove that his remote progenitors were seized in the fee simple by the creator, who, possibly in the form of a great spider, then walked the earth.

All this *en passant* and only to excuse some very apparent sins of omission for which the writer hopes to make amends the next opportunity he has of visiting Akpafu.

The Akpafus must immediately strike even the most casual observer as a people differing from the surrounding tribes.

Their huts are flat roofed (with mud) instead of the conical grass-roofed houses of the Ewe race. Their language is not Ewe, but a remnant of some ancient tribal idiom. These differences were well exemplified during the Ashanti invasion of Togoland some generations ago, when, as the native chronicler put it, "the Ashantis passed them (the Akpafus) by with the words 'We have not come to make war on them who build flat-topped huts.'" Enough, however, of the racial and linguistic

peculiarities of these interesting people, and to pass on to a description of the iron industry as carried on by them in the past.

"In the past," for, sad to relate, the introduction of the trade iron and copper rods has all but killed this once immense industry, and the mouths of ancient mine shafts, almost overgrown with vegetation, are now the haunts of bats and leopards. The present article will fall under three descriptive heads—

- (a) The mines themselves.
- (b) The smelting furnace.
- (c) The blacksmith's shop, his tools, and articles of manufacture.

(a) *The Mines.*

The greater part of the mountain where the village of Akpafu now stands is a mass of ironstone rocks; within living memory the present inhabitants lived away across the valley to the west, and only came over to work the ore.

Of these mines the natives say there are over one hundred. All were sunk at a period of which they have no recollection, and whether by their ancestors they do not know. The writer will describe the one mine he had time to visit. This particular mine was not sunk vertically, but was run into the side of the mountain; the entrance, exactly that of a cave, was a low archway, and this shape was continued throughout, falling as low as 2-3 feet and rising to 5-6 feet, with a space between the foot of the walls of 10-15 feet. The shaft ran into the mountains in a winding tunnel. The native guide made the writer take a rifle in case of an encounter with leopards, but nothing more exciting than thousands of bats was encountered, the droppings of which through the ages has made an ankle-deep carpet of pungent dust. Asked how the ore was quarried, the guide promptly sat down and with a long stick like a spear shaft, which was shod with a piece of iron (which later on investigation proved to be a perfect example of the socketed celt), he struck, or rather prodded, upwards at the arched roof. The slowness of such a process well exemplifies the immense age and time that must have been expended in quarrying out a shaft such as described. The shaft was followed for about 50 yards, till enormous boulders blocked the passage, but the dim light of the lamp carried showed it running into the distance till lost in the gloom.

The guide, striking out with his stick, killed many of the bats already mentioned, and of these he afterwards made a necklace by stringing them together by the wing-tips.

Many of the shafts, the writer was told, were sunk vertically with side galleries running out from the vertical shaft. The ore in such cases was passed up in baskets from hand to hand by men standing in notches made in the shaft. Curious stories are current, but could not be verified, regarding finds by the miners of "yellow metal" articles, some, it was stated, like hammers. The old men who mentioned these said that such finds were considered so unlucky that they were immediately buried on the spot and work discontinued in that locality. Pure mythology again

has it that some workers once sank a shaft so deep that they came on an underworld of people driving cattle and sheep in the gloom, and fled in terror.

The natives say the miners worked without lamps, their eyes being accustomed to the darkness.

(b) *The Smelting Furnaces* (Plates XXI, XXIV).

The furnace visited is set at the foot of the conical mountain at the base of which Akpafu lies. It was tumbling to ruin, and is seldom now used.

The rough sketches made on the spot will give some idea of this structure. Plate XXI, A, is the body of the furnace, about 4 feet high and 3 feet in diameter at widest, and with a bottle-shaped neck. Down the centre runs a chimney about $1\frac{1}{2}$ feet diameter (shown by dotted lines). At the base is an entrance or doorway, B.

Round the base of the structure, at floor level, C, are other holes leading into the chimney; these are used for poking the charcoal in the funnel. Perhaps they have also something to do with ventilation of funnel, as their number (six) would otherwise seem unnecessarily many.

The main doorway, B, is for raking out the charcoal and ore. When the fire is lit it is mudded up, and only a small hole left through which the dross runs away. Round the base of the furnace runs the footway, C, and a mud wall, D. This is possibly to keep out rainwater, as the furnace is built on the sloping side of the hill.

The whole structure is covered by a flat roof, E, surrounded again by a low parapet of clay, F. This roof is supported by the upright poles seen, and by cross poles, of which one is seen, lettered G. Above the roof projects the top of the chimney, H. This is raised to keep out water, and a duct is further left in the side at I for storm water to run off the roof. The flat roof serves both as a protection to the structure from rain and as a platform on which the worker stands. All the wooden supports are rotting away, and will not much longer support this superstructure. On the roof is seen a slab of wood, J; this has not been sawn, but cut out of a solid trunk. K and L are stones to lay on top of the wood when it is placed in position over the mouth of the chimney (to keep out rain).

As to the methods of smelting, the information given was as follows: Charcoal is made by burning wood which has been cut into faggots, and which are quenched with water at a certain stage. The chimney, or funnel, is then filled up, the fire lit at the bottom, at D, and this exit then closed by being plastered with clay, only a small duct being left for the dross to run out. The ironstone, broken up in pieces, is now poured from a basket on top of the charcoal through the top of the chimney at H. This is again covered with charcoal. The whole is now left about twelve hours. The fire is poked from time to time through the holes round the base of the furnace. The dross runs out at the duct left at B. When the workers think the ironstone has been sufficiently treated, the mud is broken away from the

door at B, and charcoal and ore (the latter now in lumps) is taken out; these lumps of iron are again broken up by hammer before being worked up at the forge (Plate XXII).

(c) *The Forge and Workshop* (Plate XXII).

This rough sketch depicts the back part of the hut where the smith works. A is the mud wall of "block swish"—*i.e.*, the process by which the wall is built up is by successive layers of swish (earth mixed with water). One layer is made at a time, allowed to harden, when the next is put on to it, and so on. In the wall itself and low down, with the bottom on a level with the raised dais, is an opening, or window, C.

This window serves to keep the bellows-worker, at the back of the screen, D cool, and also helps the draught through to the fire.

D is a mud wall made parallel to the wall of the hut. On the left it comes down, bends, and is carried back as E, forming with D a trench, trough, or coal box, for here the charcoal is placed. At a point near F is a hole leading through the wall, D, to the other side. Through the hole the nozzles of the bellows are placed. The bellows are worked by the man behind the mud screen, D. This screen, D, is apparently to ward off the heat of the fire from the worker of the bellows.

The burning charcoal is blown into a white hot flame, and the iron to be worked up is held in this by the workman standing in front of D. On the left is seen a hollow cup or basin, G, into which the smith dips his tongs from time to time to cool them.

On the raised dais, or floor, B, already mentioned, are stands (of mud) for the bellows, H and I, when not in use.

Lower down on the left is a mud seat, J, on which the worker rests while waiting for the iron to get hot. In front of the screen, D, and a little to the right, is a pedestal, also of swish, with a cup top. This is called *eti*, and is a font for offerings (bits of ore, etc.), paid by other smiths or strangers who borrow the use of the forge.

In the foreground are the anvils, K and L, which will be described later, *vide* Plate XXIII.

Tools and appliances used by smith.—These comprise bellows, hammers, tongs, and anvils. Plate XXIII, I, Fig. 1, shows the wooden part only of the bellows. The whole is cut out of one block of wood: A and B are hollow cylinders, C and D the holes in which the wooden nozzles seen in Fig. 2 are stuck. I 2 shows the bellows complete: the bags are made of the skin of a bush buck, E, and are made concertina-like by bands of wood; F and G are the handles.

I 3 (Plate XXIII) shows a wooden clamp. It is slipped over the handles, F and G, and the string seen is then bound round the woodwork, passing through the gap, H. This serves to keep the concertina part of the bellows firm when they are not in use.

14 (Plate XXIII) shows a forked piece of wood on which the bellows are placed when worked behind the screen, D (Plate XXII).

15 and 16 (Plate XXIII) show respectively the iron hammer and tongs used by the smith. There were several such hammers, of uniform shape, but varying in size and weight.

The anvils, two of which are seen in Plate XXII, K and L, will now be described.

Stone anvils (Plate XXIII, II, 1, 2, 3).—The shape of these stones is exactly an ellipse. There were four in the smith's shop. II 1 shows the appearance when viewed from the side; II 2, when standing on edge; and II 3, *norma verticalis*. The surface is perfectly smooth, so much so that they are possibly water-worn, but the shape is so extraordinarily symmetrical as to appear artificial. When viewed from above, they appear exactly like the back of a large jelly-fish. So hard are these stones that the hammering, possibly of centuries, has left barely a chip.

This description will be closed with a brief reference and illustration of two articles depicted in Plate XXIII, II, 4 and 5.

Fig. 4 is a knife, or sickle, apparently of great age. It belonged to the ancestor of the present smith, and had been handed down through generations.

Figs. 5 and 6 are possibly the most interesting items in the whole series, for we have here a perfect example of an iron socketed celt. It was an implement such as this which, hafted on a long 6-foot shaft, was used to hew out the ironstone in the mines.

MISCELLANEA.

PROCEEDINGS OF THE ROYAL ANTHROPOLOGICAL INSTITUTE, 1916.

January 18th, 1916.

Annual General Meeting. (See p. 1.)

March 28th, 1916.

Ordinary Meeting (Joint Meeting with the Prehistoric Society of East Anglia). Professor A. KEITH, President, in the chair.

The minutes of the last meeting were read and confirmed.

Miss N. LAYARD read a paper on "Hand Grips," illustrated by specimens and lantern slides.

The conclusions of the lecturer were discussed by Mr. REGINALD SMITH and Mr. H. D. SKINNER. The thanks of the meeting were accorded to Miss LAYARD for her interesting paper.

The Rev. J. W. HAYES read a paper on "Irish MS. and other Evidence of the Use of Stone Weapons, including Smooth Stone Celts within Historic Times," illustrated by specimens and lantern slides. Dr. A. C. HADDON, Mr. A. L. LEWIS, Mr. H. D. SKINNER, and Mr. N. F. ROBERTS took part in the discussion which followed. The thanks of the meeting were returned to Mr. HAYES for his interesting contribution.

The Institute then adjourned.

May 23rd, 1916.

Ordinary Meeting. Professor A. KEITH, President, in the chair.

The minutes of the last meeting were read and confirmed.

The election of the following as Ordinary Fellows of the Institute was announced: Mr. A. B. HITCHENS, Rev. F. C. MEREDITH, Mr. GRAHAM MILWARD, Lieut. C. E. M. WOODFORD, Mr. J. E. AGGREY, Miss MARGARET A. MURRAY, Rev. J. H. PHILLIPSON, Mr. J. W. LAYARD.

Dr. A. C. HADDON read a paper on "The Canoes of British New Guinea," illustrated by slides.

The paper was discussed by the PRESIDENT, Dr. SELIGMAN, Professor ELLIOT SMITH, Dr. HARRISON, and Mr. RAY, and Dr. HADDON replied.

The thanks of the Institute were accorded to Dr. HADDON, and the PRESIDENT expressed the hope that the paper would be available for publication in the *Journal*.

The Institute then adjourned until October.

October 31st, 1916.

Ordinary Meeting. Professor A. KEITH, President, in the chair.

The minutes of the last meeting were read and confirmed.

The election of the following as Ordinary Fellows of the Institute was announced :
Mr. I. H. N. Evans, Dr. R. H. Harris, Mr. H. J. T. Johnson, Mr. W. P. Peake.

Mr. AUBYN TREVOR BATTYE read a paper on "The Ghurkas and their Country," illustrated by slides.

The paper was discussed by Captain BARTON and Dr. SELIGMAN.

The thanks of the meeting were accorded to the Lecturer, and the Institute adjourned till November 28th.

November 28th, 1916.

Ordinary Meeting. Professor A. KEITH, President, in the chair.

The minutes of the last meeting were read and confirmed.

The election of the following as Ordinary Fellows of the Institute was announced :
Mr. O. C. Bevan, Capt. D. E. Finlay, Mr. G. A. Garfitt.

Professor G. ELLIOT SMITH gave an address on "The Common Objections to the Reality of the Migrations of Early Culture, with Special Reference to the Dogma of the Similarity of the Working of the Human Mind," illustrated by lantern slides.

The paper was discussed by the PRESIDENT, Mr. HAROLD PEAKE, Dr. HADDON, Sir HENRY HOWORTH, Miss FREIRE-MARRECO, Dr. SELIGMAN, Mr. E. A. PARKYN, Mr. A. L. LEWIS, and Professor ELLIOT SMITH replied.

On the motion of the PRESIDENT the hearty thanks of the meeting were conveyed to Professor ELLIOT SMITH for his very interesting and important paper.

Sculptured Figures from near Aden.

[WITH PLATES XXV-XXVII.]

BY the Honourable JOHN ABERCROMBY, F.S.A.Scot.

Plates XXV-XXVII represent a very rudely sculptured figure of a man, apparently in a squatting attitude, showing the front, the back and the left side in profile. The material is nearly white alabaster traversed by brownish veins or streaks. One vein runs across the figure diagonally, passing under the chin. Another descends from the shoulder over the left hand to the left foot. A nearly horizontal streak runs below the back of the head and across both shoulders. The whole of the animal seen at the back, Plate XXVI, is carved out of a lump or patch of the same brown material.

The shaven head is nearly flat at the top, and the occiput forms a considerable bulge at the back. The forehead is extremely low and the expressionless face is very broad, with full cheeks, which are also close shaven. The beak-like nose is very pronounced and, taking its rise in the forehead above the line of the eyebrows, curves inwards to the upper lip without forming a point and without indication of nostrils. The eyebrows slope downwards over long narrow eyes. A horizontal incision indicates the mouth and the upper part of the lower lip. Another incision marks the limits of this lip and the beginning of the smooth chin. No ears are shown and the head is so sunk between the shoulders that no neck is visible. The arms press against the body; the lower arms are bent upwards at the elbow and terminate in large clenched fists which seem to be holding the two ends of a thickish pendant cord, hardly a necklace, as it does not pass round the neck. Both legs and feet are hopelessly formless and undefined, but the belly between them is well rounded. The outline of the animal, apparently a sheep, Plate XXVI, is not very well defined, especially the head and belly, so that its sex remains uncertain.

Measurements are as follows:—

Height from crown of the head to sole of left foot 14·5 cm.

“ “ “ “ “ “ “ “ “ “ right “ 14 cm.

Owing to this difference in height the figure cannot stand without support.

Width across the shoulders 11·2 cm.

Length of the sheep from root of the tail to the forehead 5·5 cm.

Height of sheep 4·3 cm.

This remarkable piece of sculpture was lent to the Royal Scottish Museum in Edinburgh some years ago, by Miss Blair of Melrose. She died in 1913, and in her will bequeathed to the Museum this figurine and an inscribed incense burner in form of a cube from Marib in Yemen. I only noticed the figure in the Museum last year when it was too late to write to Miss Blair for particulars of the find, the label only stating that it was “found near Aden when repairing the dam built by the Queen of Sheba.” Miss Blair probably came into possession of these objects on the death of her father, who was an officer in the Indian Army and may have been stationed at Aden when the dam was being repaired. Owing to her death it is not now possible to obtain any further details.

Although Asiatics are clever forgers of antiques, there seems no reason to believe that the figure is not genuine. For one thing, a modern forger would hardly think of introducing an animal at the back.

The question that remains to be elucidated is whether the figure is a specimen of the prehistoric art of Yemen or an importation. The large face is evidently anything but typical of a pure Arab, as the type is generally understood. Though the sculptor was evidently unskilled and not to be relied upon in anatomical details, it may be conceded

that he intended to represent a beardless person with shaven head and cheeks. Such persons are known from early Sumerian sculptures from Tello and other places in Mesopotamia.¹ The central figure of Fig. 11, has, moreover, a low forehead and hooked nose not unlike that of Pl. XXVII, and the same may be said of Fig. 44. From an early period the Egyptians were accustomed to shave the face, and the head too was sometimes shorn.² Many of their early sculptures, too, represent men with heavy, squarish faces. In Egyptian paintings the Arabs are always shown with a good stock of hair and a pointed beard. Though Herodotus mentions that the Arabs "cut their hair in a circle round, shaving away the hair of the temples," that does not mean that the whole head was shorn, it refers to a sort of tonsure.

Although too much stress must not be laid upon any physical feature of the specimen, owing to the incapacity of the sculptor, it may be admitted that the nose forming a straight line with the forehead and curving inwards seems nearer to the so-called "Armenoid" type than to any other. Dr. Elliot Smith³ has recognized a typical "Armenoid" Semite in a carved ivory figure, dating as far back as the Ist Dynasty. And he remarks that "by the time of the Pyramid builders the physical character of the people of Lower Egypt had been modified to a marked degree by an infusion of alien blood."⁴ By alien blood he means persons showing "Armenoid traits." What is true of Egypt is probably true of Arabia, namely that an "Armenoid" type of man began to filter down from the north into Southern Arabia at an early period. From the above remarks it seems probable that the people who produced the art represented by the figure came originally from the north, though the figure itself cannot be assigned directly either to Sumerians or Egyptians.

The early history of Southern Arabia is only imperfectly known, but it was occupied by four nations, Sabæans, Minæans, Katabanians, and the people of Hadramut. The dialect of the Minæans, which might be termed Hadramitic, was sharply distinguished from that of the Sabæans, and the former, in the opinion of D. H. Müller, entered the territory of the Sabæans from Hadramut. The Sabæan dialect lies much nearer to that of the northern Arabs. In fact, E. Glaser thinks that the Sabæans lived originally in the north of Arabia, and in the ninth or eighth century B.C. moved down the west coast southwards, and conquered the Minæans. An Assyrian inscription mentions that Itamara of the land of Saba paid tribute to Sargon in 715 B.C., which shows that some Sabæans were living in the north at that period. The capital of the Sabæan Kingdom was Marib, and the famous dam there was the work of Yatha'amar, who is possibly the "Itamara sabai" of Sargon, though four kings of this name are known from inscriptions. The capital of the Minæan Kingdom was Ma'in in the heart of the Sabæan territory. But they must have had a colony in the north, as is proved by an inscription from At'ola which lies north of Medina on the new railway to that town. Not much is known of the Katabanians, but they lived in the extreme south-west, near the Straits of Bab-el-Mandeb with their capital at Tamna, and so Aden would lie in their territory. As the great dam at Marib appears to belong to the early part of the eighth century it is not impossible that the dam near Aden was constructed in the same century.

Among the few letters of Miss Blair preserved in the Royal Scottish Museum is an envelope containing a photograph, a reproduction of which is given by Figs. B, C. The

¹ L. W. King, *History of Sumer and Accad*, figs. 3, 4, 5, 11, 44.

² Wilkinson, *Ancient Egyptians*, vol. ii, figs. 475, 459.

³ Elliot Smith, *Ancient Egyptians*, fig. 6.

⁴ *Op. cit.*, p. 98.

envelope is docketed outside as follows ". . . photo of the Queen of Sheba's idols that are in the Museum at Bombay (I think); were found near Aden when repairing the dam built by the Queen of Sheba in recognition of the benefits she had received from her visit to King Solomon." Unfortunately I have heard from Mr. Cecil Burns, Curator of the Victoria and Albert Museum, Bombay, and from Mr. Bhandarkar, Superintendent of the Archæological Survey, Western Circle, Poonah, that no sculpture corresponding to the photograph which I had sent was in the museums under their charge. The Superintendent of the Indian Museum, Calcutta, has also informed me that the originals of Figs. B, C, are not in the Indian Museum, and have never been in the collection so far as can be ascertained.

As I have not seen the originals I refrain from making any remarks, especially as I cannot explain the meaning of the two groups, nor state their scale with reference to the original pieces of sculpture. I leave any explanation to those who are better instructed than myself.

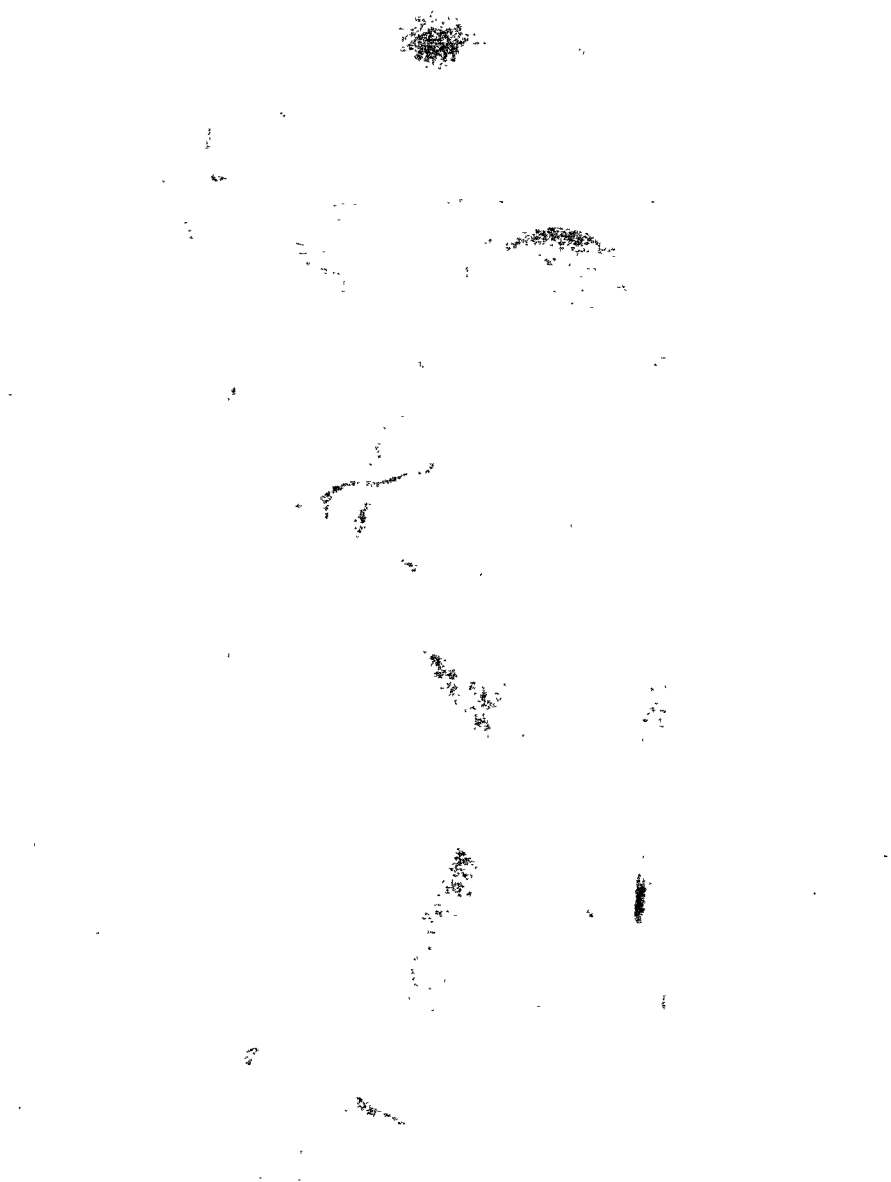




A.—FRONT VIEW OF ALABASTER FIGURE.



B.—BACK VIEW OF ALABASTER FIGURE.



C.—SIDE VIEW OF ALABASTER FIGURE.

Erratum and Addendum to The Bantu Coast Tribes of the East Africa Protectorate.

By A. WERNER (*Journal*, Vol. XLV, p. 326).

Erratum.—p. 337, line 33, for Hollis read A. H. Champion.

Addendum.—LIST OF WA-DIGO CLANS.

Clans (Mbari) of the Wa-Digo.

Kinangala, Clan of the Kubu (or "Sultan")	Wajiwana
Dabara	Wachongo
Agwirani	Kinangeme
Njeja	Kinaganji
Kinyavu	Kinabanya
Kinauchi	Kinahayu
Kinamanji	Kuria
Waiyambo	Saburi
Waranai	Wambugu
Kinesheruka	Kina Lela
Chauzi	Kina Kalangwa
Airizi	Kinamwachome
Miragea	Kinavuna
Kinazira	Harufu
Alumbwi	Kina Bwendi
Kunduchi	Kinaguru
Waijimbo	Kina Kuyu

Digo Clans.

Mwana mata	Atina
Anzira (very large clan)	Agotze
Badza (no kuke clans)	Angala
Lago	Chinakulu (very large clan)
Adzirribe	Ambeli
Achonwa	Mkuha (clan of Mkowa's mother)
Atzui	

Digo children when weaned go back to mother's brother's village.

ARTHUR M. CHAMPION.

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